ENGINEERING LIBRARY

CALIFORNIA

OIL WORLD

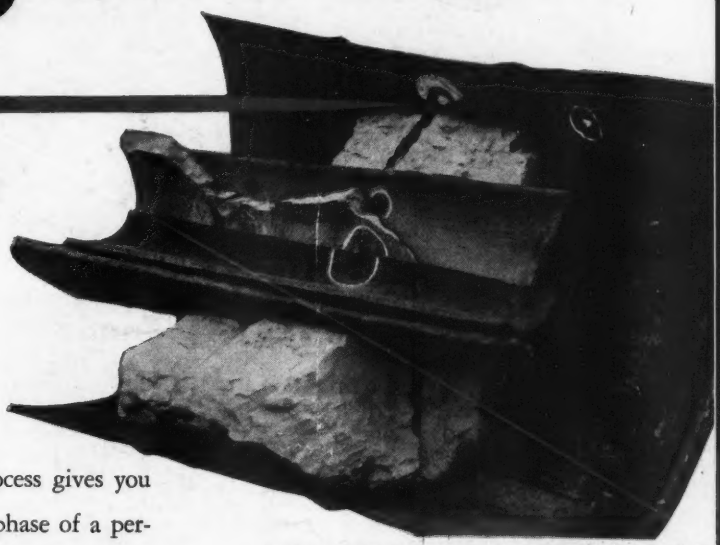
TWICE MONTHLY • FIRST ISSUE • JANUARY, 1948

Perfo-Jet HAS A PAYOFF PUNCH

ASSURED PENETRATION...

DEEPER...

FASTER



HERE'S PROOF OF PERFO-JET PENETRATION. Photo of 7" cemented in a 10¾" pipe cemented in a 55-gallon d subjected to a penetration test with Perfo-Jet. There's a ½" hole through casing, cement, and out through the d

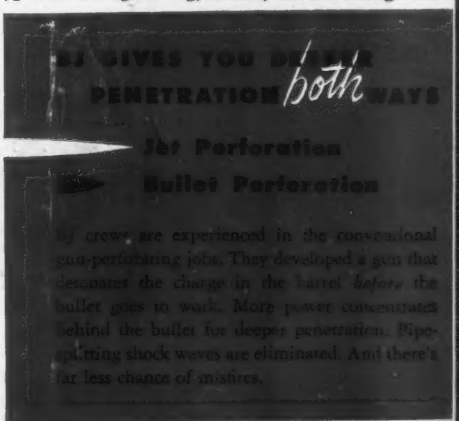
Perforation without bullets. BJ's new Perfo-Jet Process gives you quick, clean casing holes with assured penetration. Every phase of a perforation job can be done better, faster, safer, and cleaner with Perfo-Jet.

BJ's partners in research. The Perfo-Jet Process was developed at the Byron Jackson experimental station, Signal Hill. The research staff of the E. I. DuPont de Nemours & Co., Inc., as well as the engineers of Well Explosives, Inc., of Fort Worth, Texas, helped BJ bring this new perforating process to you.

OPERATORS, BJ experience and BJ Engineered Equipment add up to less rig time. Write us or call today for complete perforating information.

Byron Jackson Co.
LOS ANGELES 54, CALIFORNIA
Offices in Principal Cities

BJ SERVICE



Presently Available in California Only

Los Angeles Basin: Phone—JEfferson 2596, JEfferson 6171, Ex
San Joaquin Valley: Phone—Bakersfield 2-5911
Coastal Districts: Phone—(Los Angeles) JEfferson 2596

STRENGTH

H. C. SMITH

ROCK BITS

FASTER...STRAIGHTER...
FULL GAUGE HOLE

There is an
H. C. SMITH ROCK BIT
for every formation...
in every field.

H C Smith Oil Tool Co.

GENERAL OFFICES AND PLANT: P.O. BOX 431, COMPTON, CALIF.

E. Engin
Fakan

East Engin.
Library
TN
860
C15

CALIFORNIA

OIL WORLD

PUBLISHED TWICE A MONTH
FOR TIMELY, COMPLETE
CALIFORNIA OIL NEWS COVERAGE

FIRST ISSUE
• JANUARY, 1948
VOL. 41 • NO. 1
WHOLE NO. 1743

PETROLEUM PUBLISHERS, INC.
MEMBER AUDIT BUREAU OF CIRCULATIONS
W. C. MONROE—President and Editor
LARRY O. MILLER, Advertising Manager

706 SO. VALENCIA ST.
LOS ANGELES 14, CALIFORNIA
KINZIE MILLER—Vice President

California Oil World is published twice a month at 706 So. Valencia St., Los Angeles 14, California. Entered as Second-Class Matter, April 29th, 1944, at the post office at Los Angeles, California, under the Act of March 3, 1879. Subscription price $1 per year in U. S. and possessions, $2 in foreign countries, including Canada. Member of the Audit Bureau of Circulations.

January 15, 1948
Telephone FAirfax 6218

Washington Highlights

A Senate Judiciary Subcommittee on February 25 will begin hearings on a resolution to permit waiving of Federal claims to tidewater lands.

Senator E. H. Moore, Republican of Oklahoma, chairman of the committee, has revealed that representatives of the Justice Department, and of the Governors and Attorney Generals of a number of states have asked permission to testify at the hearing.

The resolution as drawn would empower the Federal Government to renounce any rights, title and interest in submerged tidelands to the states.

Incidentally, an inquiry into activities of the so called oil lobby here evidently has the blessing of the Administration. The investigation is analyzed by most oil men as a device to hinder and discourage the industry in its campaign for a quitclaim resolution to the states on which the tidelands border.

Other members of Senator Moore's committee are Senators Donnell of Missouri, and McCarren of Nevada.

The resolution now before the Senate was introduced a year ago by Senator Moore for himself and Senators Knowland and McCarren. Knowland is a California Republican.

Unofficial calculations indicated that the immediate stop-gap aid program for Europe will entail shipment of approximately 16,000,000 barrels of petroleum and products to France, Italy and Austria. Most of this oil will come from the Middle East. These supplies are expected to last until April. Crude oil will make up about 10,000,000 barrels and the balance will be represented by various types of products.

"Program of Action for 1948" has been published and distributed by the American Automobile Association. It contained a statement on the gasoline situation of considerable interest to Washington observers.

"The demand for petroleum products of all kinds is at an all time high," it said. "The balance between supply and demand is now so close that it could be easily upset. Serious product shortages could develop, including a shortage of gasoline. The American Automobile Association views this situation with real concern. It strongly urges that steel and other materials be made available in sufficient quantities to speed up the programs now under way for oil well drilling, new refineries and petroleum pipelines. It is urged that the U. S. Maritime Commission speed up withdrawals of additional tank ships from Government laid up fleets to take care of domestic needs, and that tankcar building programs be accelerated.

"It should be the policy of Government and industry to meet oil commitments for aid to Europe from oil areas outside the United States and it should be the policy to balance product or crude exports with imports. Our domestic needs must at all times have first call on America's petroleum resources."

Senator Downey, Democrat of California, as yet has expressed no desire to assume the duties of Democratic national committeeman, being relinquished by Edwin W. Pauley, California oil leader.

Choice of a successor to Pauley in harmony with all Democratic factions in California was seen as the chief reason for the recent visit to the Pacific Coast of Senator McGrath, Democrat of Rhode Island and Democratic National chairman.

Congressional action on repeal or revision of the Federal emergency automotive excise taxes is promised in a tax cut plan presented to Congress. Representative Dingell, Democrat of Michigan, has introduced a House bill, proposing a $5,500,000,000 total tax reduction. Among other requests it asks that the Federal automotive taxes be restored to their prewar rates. This would involve a cut of $556,000,000 in this type of taxes alone.

We christened it something else, but you named it...

SHOOT-N-TEST

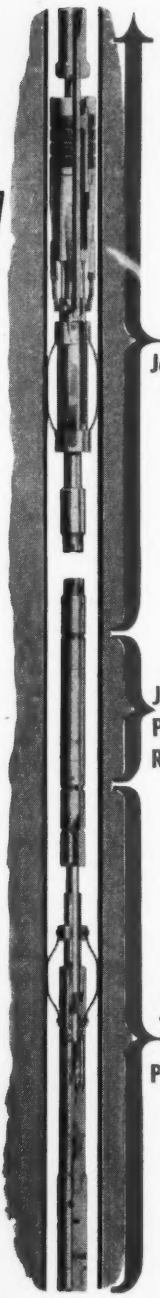
with

THE JOHNSTON *all purpose* **GUN PERFORATOR**

QUICK TO RECOGNIZE the outstanding performance of the JOHNSTON All Purpose GUN PERFORATOR, field men have been constantly calling for "SHOOTING TESTS." So as a tribute to the men who have enthusiastically endorsed this new method of gun perforating and combined perforating and formation testing we have named this operation "SHOOT-N-TEST."

"SHOOT-N-TEST"
With the Johnston All Purpose Gun Perforator
OFFERS THESE FEATURES

- SAFER GUN OPERATION
- POSITIVE FIRE OF ALL BULLETS
- ANY NUMBER OF PERFORATIONS
- EXACT POSITIONING in test zone
- MINIMUM NUMBER OF EXPENDABLE PARTS
- FAST, EASY MAINTENANCE



The Johnston Gun Perforator connected to a regular Johnston Pressure Recorder and Formation Tester permits the operator to "SHOOT-N-TEST" in one trip of tubing or drill pipe.

SHOOT-N-TEST Trademark FORMATION AND CASING TESTING JOHNSTON

M. O. JOHNSTON OIL FIELD SERVICE CORP.

3035 Andrita Street, Los Angeles 41, California

"Servicing California-Permian Basin-Rocky Mountain Areas"

BRANCHES

BAKERSFIELD, CALIFORNIA • AVENAL, CALIFORNIA • SACRAMENTO, CALIFORNIA • VENTURA, CALIFORNIA
SANTA MARIA, CALIFORNIA • ODESSA, TEXAS • CASPER, WYOMING • HOBBS, NEW MEXICO

The Effect of Hole Enlargement on Cementing and Completion Practices

Abstract

The discovery of new oil fields is becoming more difficult and costly. The improvement of our completion practices is an alternative means of increasing our national petroleum reserves and will often enable operators to drill properties which could not be developed under old methods.

The drilling section of the oil industry is continually striving to perfect these practices and this paper reports some of the recent developments in completion techniques. Caliper surveys, hole enlargement, drilling fluids used in the producing section and some of the problems encountered in cementing and completing wells are discussed.

Bruce Barkis & Kenneth A. Wright
B and W, Incorporated

Introduction

Since the development of the hole caliper by Myron Kinley and its introduction to the industry in 1940-41, many of the problems concerning our cementing and completion practices have been clarified. In the early days of rotary drilling the importance of good mud control was not appreciated and stuck drill pipe and serious fishing jobs were very common. It is realized now that this was undoubtedly caused by thick high water-loss muds and enlarged holes.

While there has been a general improvement in drilling mud, and a considerable reduction in the amount of fresh water lost into the formations, caliper surveys still show that hole enlargement persists.

This hole enlargement adds considerably, both directly and indirectly, to the cost of drilling and completing wells, and further improvement of our drilling fluids is necessary before all wells are "drilled to gauge."

By 1932 a clearer understanding of the varying qualities of drilling fluids, the effect of the filtrate on the productivity of the sands, and the need for cleaning rotary drilled wells was developing. Rubel[1] stated "In semi-depleted fields, however, where formation pressures have declined to small figures, the problem is most serious. There are numerous instances on record where in sands known to be capable of producing 50 to 250 barrels per day production, no oil can be commercially produced at present with rotary drilled holes, and when, unless other means are employed, large reserves of oil will be lost to the industry."

Mud Cake Formation

As far back as 1922, one of the larger operating companies included in a report on drilling fluids the statement "The speed of the "mudding off" process is practically instantaneous." This fact, however, is often overlooked or ignored in current operations.

In testing a sample of mud for its water-loss rate in the pressure cup, the 100 pound pressure used forms a large percentage of the mud cake in a few seconds. The identical action occurs in the well only more rapidly because of the greater differential pressures, higher temperatures, drilling fluid contamination and other factors contributing to the thickness and type of mud cake.

There is a continuous disturbance of the filter cake while the drill pipe is being run in, pulled out, or rotated, and during the reaming, scraping or scratching operation. A new cake immediately forms, however, composed of the disturbed material—bit cuttings, sand and other solids in the drilling fluid. The filtration rate for this wall cake is undoubtedly more than for a carefully selected sample from the ditch and the amount of water lost by filtration into the formation would be greater.

This conclusion was verified in a recent completion. The hole was conditioned prior to running slotted liner, and the oil emulsion mud weight, as the drill pipe was pulled from bottom, was 70# cu/ft. (9.3# gal.) with an average filtration rate of 1 cc. It required 14 hours to

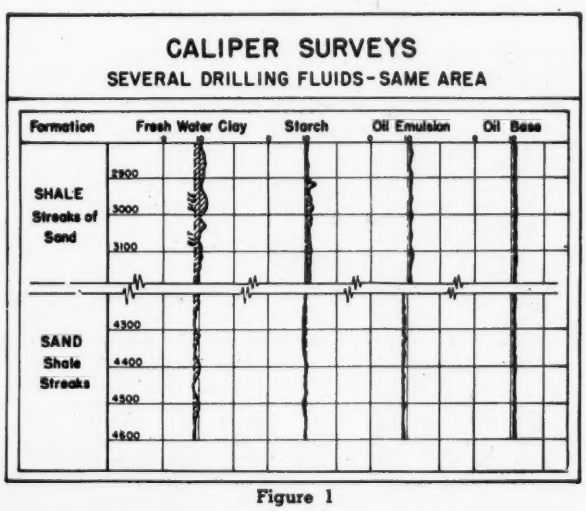


Figure 1

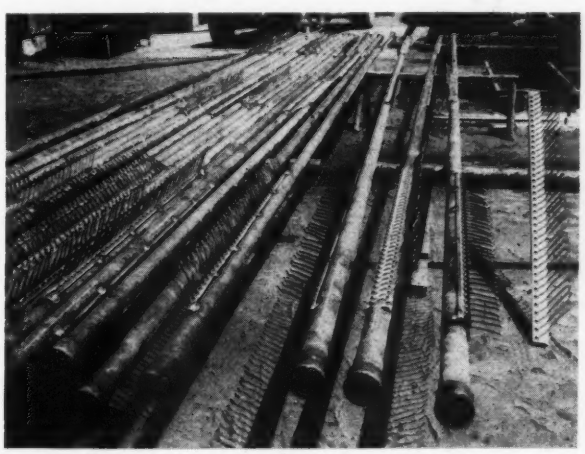
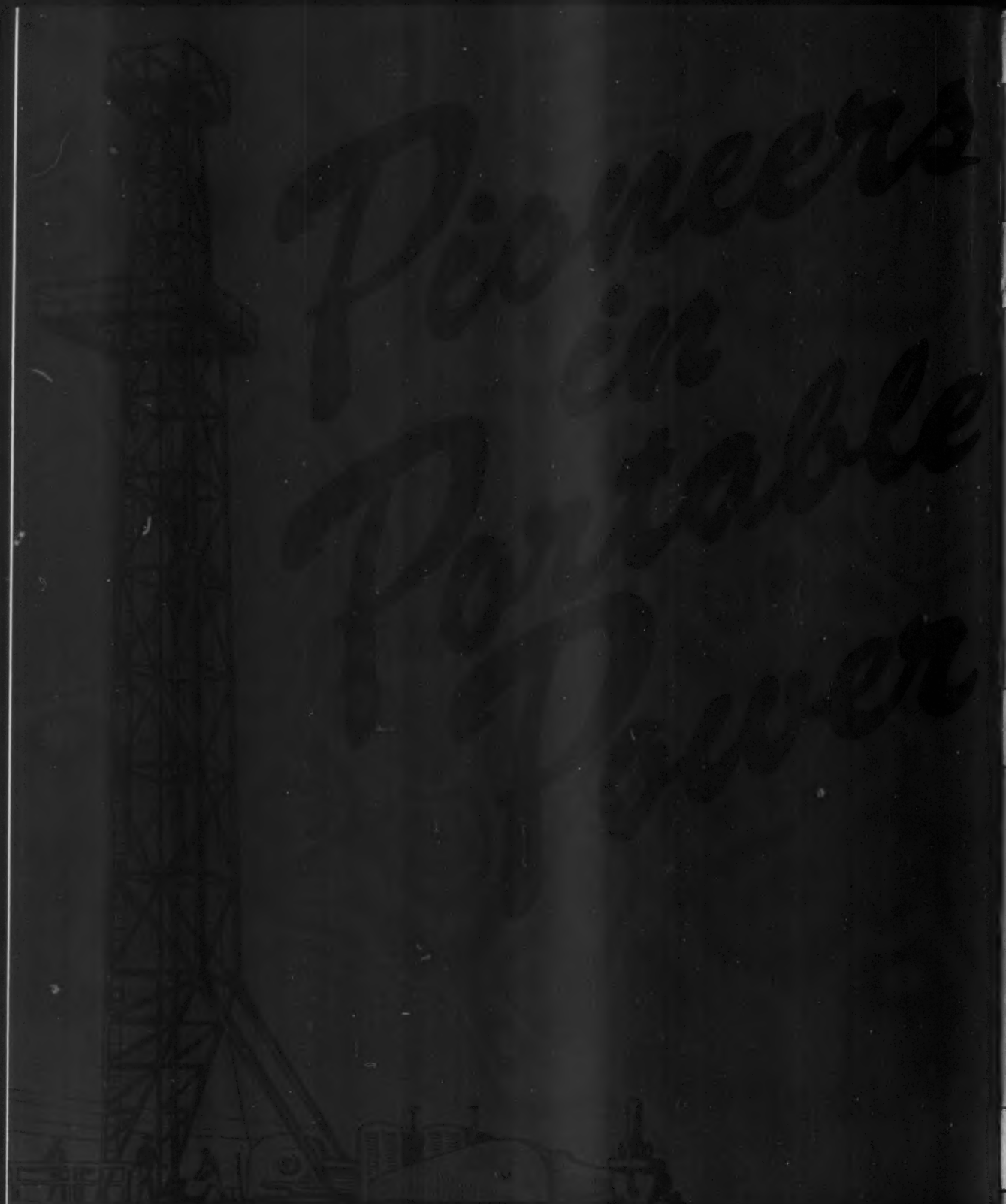


Figure 2



BROWN DRILLING

COMPANY

LONG BEACH, CALIFORNIA

pull out, make up the slotted liner assembly, including wash pipe to bottom, and run to bottom. When circulation was established, and returns from bottom recovered, the mud weight had increased to 80# cu/ft. (10.6# gal.) An analysis of the complete data on this installation showed that the amount of water lost from the mud was far greater than indicated by the 1 cc. rate in the testing apparatus.

Hole Enlargement

Hole enlargement may be defined as the increased volume of the drilled hole over the cylinder whose diameter equals the bit diameter. The causes of hole enlargement include:

(1) Water infiltration.
(2) Nature and content of the formations.
(3) Behavior of the drilling string.

The action of the filtrate from the drilling mud in swelling, disintegrating, caving, eroding and enlarging the drilled hole has been recognized for some time. A recent study shows the varying amounts of hole enlargement when the same formation is drilled with different fluids. This survey (Figure 1) shows more hole enlargement in the well drilled with fresh water mud and indicates that the holes drilled with oil emulsion and oil base muds are very "close to gauge." This latter conclusion has recently been questioned, however, and there is evidence that some of the enlarged sections have been filled in or "pastered" with fairly dense mud cakes.

A comparison of the mud cakes recovered with mechanical sidewall coring devices on sand or shale formations shows a considerable difference in thickness and character. As a general rule the mud cake recovered from the shale sections is fairly thin, while mud cakes from ½" to 2" thick are common in the sandy sections. In several wells, the productive section below the casing, has been cleaned with rotating scratcher assemblies. In the normal wall-scraping operation a large amount of the material removed by scraping is re-deposited above the scraping assembly. To avoid this re-deposition, an assembly was recently run as shown in Figure 2 throughout the entire open hole section and the drilling fluid was displaced with clean oil. Salt water, of increased salinity, can be used and has the added advantage of flocculating the mud and further cleaning the open hole section.

The amount of material recovered during the scratching and washing operation as shown by the mud cake, bit cuttings and other solids recovered on the shaker would represent a sizable increase in hole diameter. It is now planned to run a follow-up caliper survey on the next test to measure this increased diameter.

With the development of the caliper survey it has also been possible to measure the varying amount of hole enlargement during the drilling life of the well. Four surveys of the same well are shown in Figure 3. It is apparent that the hold contour is not constant, and that extensive filling with mud cake of sufficient strength to withstand the pressure of the caliper arms, is indicated at certain depths, while continued enlargement is shown at other depths.

The chemical composition and hydrocarbon content of the formations have been reported as responsible for varying amounts of hole enlargement[2], and the effect of the drilling string through misalignment, excess weight on the bit and other factors on the amount of hole enlargement has been investigated[3], but most studies indicate, however, that the effect of the fresh water filtrate on the formation is of more importance, and the general conclusion that the amount of enlargement is closely associated with the amount of fresh water lost into the formation appears to be justified.

Placement of Cement Slurry

The cementing tests reported by Jones-Berdine[4] in 1940 were the first to disprove the widely accepted belief that cement slurry scoured the mud cake from the formation face. These tests included all equipment available at the time to improve the contact of the cement with the formation and concluded in part "Whenever cement slurry is applied opposite formations having appreciable permeability, a residual mud cake will remain between the set cement and the formation unless specific measures are employed to effect its removal."

More recently similar tests were made in actual well installations.

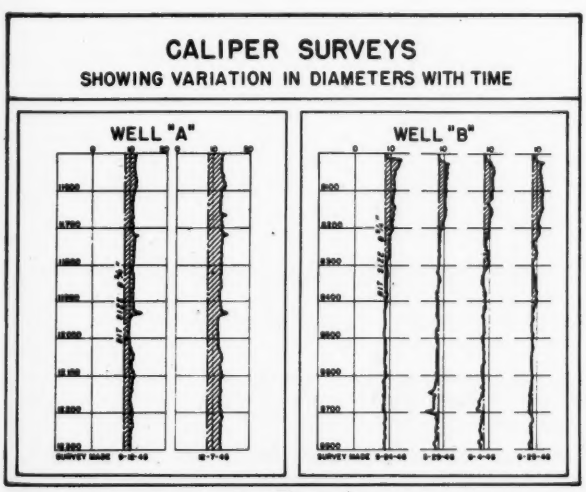


Figure 3

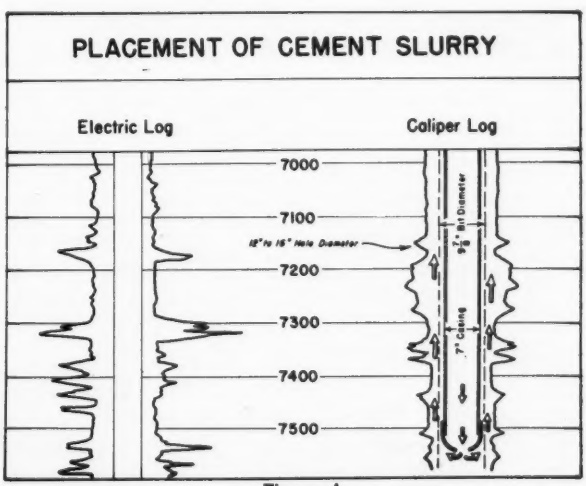


Figure 4

JET PERFORMANCE

BY THE

"MIDLEAN" Mud Gun

CASE HISTORY NO. 29

A well-known Texas operator has a MIDLEAN Mud Gun that has shown and is still showing real jet performance. He has drilled 16 wells to an average depth of 7500 feet, each hole calling for an extensive mud program. The mud pits for each of these wells were gunned with the *same* Patterson-Ballagh MIDLEAN Mud Gun. Not one penny was spent on repair for this MIDLEAN.

Rough service has become the byword with the MIDLEAN Mud Gun and this Gun has shown the stamina and economy for which MIDLEAN Mud Guns are noted everywhere. Each Patterson-Ballagh MIDLEAN Mud Gun is equipped with standard Patterson-Ballagh PBX Rubber Lined Nozzle which holds to gauge and delivers a strong, steady jet. The MIDLEAN is spin-proof, non-sticking and easily controlled. This example of automatic, trouble-free service is typical of reports from oil field operators the world over. Dependability, stamina, engineering know-how are all combined in the reasonably priced MIDLEAN. To end your quest for an economical, field-proven Mud Gun

PATTERSON BALLAGH · SEAL OF QUALITY · OIL FIELD SPECIALTIES

Specify

PATTERSON-BALLAGH

DIVISION OF BYRON JACKSON CO

MUD GUNS AND NOZZLES

MAIN OFFICE: 1900 EAST 65th STREET, LOS ANGELES 1, CALIFORNIA

6247 Navigation Blvd., Houston 11, Texas • 808 Graybar Bldg., New York 17, N. Y. • 330 Russ Bldg., San Francisco 4, Calif.

T.I.P.S.A., Santiago Del Estero 286, Buenos Aires, Argentina • H. F. Towler, 9 Cavendish Square, London, W1, England

These were reported by Teplitz-Hassebrook[5] in 1946, and included comparisons between the results obtained in cementing "bare" casing which was not moved during the cement placement, and with casing equipped with scratchers and centralizers, and moved during the cementing operation. Their report states—"The usual casing cementation ends up with the annular column consisting roughly of half cement and half mud, i.e., over the total distance pervaded by the cement", and their conclusions reports "By properly equipping the casing with scratchers and centralizing devices, reciprocating the pipe while placing the cement, and speeding up the rate of pumping, it has been possible to practically eliminate channelling and thus greatly increasing the proportion of successful casing settings."

When cement slurry is pumped around casing and into an irregular annulus, as shown in Figure 4, the cement slurry only displaces a portion of the mud in the annulus volume. The velocity of the upward traveling slurry varies from 2-5'/sec, which is in the viscous flow range. The forces exerted at these velocities are insufficient to put all of the drilling fluid and mud cake in the annulus into motion.

The cement slurry therefore travels upward at almost constant velocity and not at the variable velocity that would result from complete displacement of the mud in the enlarged sections. The percentage of cement fill would undoubtedly be higher in a hole of constant diameter, and, in addition, the effectiveness of centering and scratching equipment would be increased.

Setting of Cement Slurry

In mixing cement slurry for usage in an oil well, more water is used than is required to hydrate the cement particles. It has been assumed that this excess mixing water "went into the formations", and considering the amount of cement normally used involves the disposal of 25-50 barrels of water.

With the introduction of improved drilling fluids, having low water loss rates, the problem of what happens to this excess mixing water becomes more important. Tests in long impermeable cylinders have indicated that the water and cement settles not in layers and such a condition would not be desirable behind the casing string.

The filtration rate into shales is very low in relation to the setting time of the cement slurry. This suggests that provision should be made for filtration of the excess water into the sand members. The mechanical approach of abrading the mud cake from the sandy formations appears to be the most direct means of providing an outlet for the filtration of this water. Even though the cement slurry itself will not penetrate into the sand formations, the filtration of this water, carrying minute colloidal particles of cement, will greatly improve the bond between the cement and the formation.

It has been demonstrated that cement slurry placed opposite a clean sand surface and subjected to 500 pounds pressure will set almost instantaneouly. This does not increase the normal cementing hazards, as long as the cement slurry is kept in motion, and a small percentage of bentonite added to the cement. This addition of bentonite to the cement slurry will not only lower the filtration rate, but will aid in absorbing excess water, in lowering the tensile strength of the set cement, and in increasing the volume of set cement.

Conclusion

Clay base fresh water mud is being used in a majority of the current rotary drilling in the United States. In field terminology it is described as "good drilling mud." This description may not be entirely correct, and may be altered when it is more widely realized that such drilling fluids are responsible, in a large degree, for the hole enlargement that causes many of our cementing and completion failures.

The cost of drilling has been shown to be closely related to the size of the drilled hole[6] or, in other words, to the amount of the material excavated. This situation undoubtedly applies to either intentional or unintentional enlargement and suggests that drilling costs should be more favorable for holes drilled to gauge. The possibility of sticking drill pipe or of having very difficult fishing jobs is more remote when a drilling fluid has been selected that will maintain the drilled hole closely to the bit diameter.

Reduction of lost rig time in fishing operations, in correcting cementing failures, or other completion difficulties, can only increase the percentage of time that the bit is on bottom in the hole making phase, which is the goal of all contractors.

E. M. Smith Gate to Be Used for Running Races

Racing fans in southern California—and there are hundreds of them among the oil fraternity — have noted with considerable interest the many comments appearing in Los Angeles dailies regarding the possibility of using a mobile gate to start running races.

The gate to which they refer is the E. M. SMITH PATENTED GATE which was used so successfully last spring at Hollywood Park for the harness races, and was later employed by leading tracks in the east and mid-west. The Hambletonian, most famous of all trotting races, was started by the E. M. SMITH gate.

"Pinky" Grimes, veteran trainer for the well known Hertz stables has the following to say regarding an "in motion" gate: "Such a gate will save many horses from early breakdowns. The rolling start will relieve the terrific strain on the legs that the standing start imposes. Experiments and plans have been under way and I think it will be tried out this next year (1948) in the east."

The new SMITH gate for 1948 is changed considerably over the one used last year at Hollywood Park. The new device makes use of a five strand rubber barrier which cannot harm the horses, and which swings open with lightning speed. It is powered by a pair of Cadillac engines with hydromatic transmissions, and has more than enough speed to outrun any horse with ease.

The Globe Oil Tools Company of Los Nietos, of which E. M. Smith is president, manufactures this gate. Globe is known throughout the entire industry—in foreign and domestic fields—for its precision built drilling tools, and its successful entrance into the racing field dates back only one year.

Vapor Output to Heat-Input Ratio for Petroleum Storage Tanks Exposed to Fire

By M. L. Arnold and G. H. Horne

December Meeting

If a storage tank is exposed to fire, its contents will be made to boil. Provision must be made to release the vapors. If the tank-venting equipment is not large enough, the tank may be damaged; and an already hazardous condition may thus be made more critical.

In this paper, generalized factors are derived for selecting the tank vents or relief valves. The procedure will be useful for two reasons: (1) Tedious computations are by-passed. (2) The venting requirement for contents of various compositions may be readily visualized. Both pressure and atmospheric-storage-tank venting are considered.

The procedure for selecting tank vents sounds quite straightforward. You estimate the total heat-input rate to the tank from the surrounding fire. Then you look up the latent heat of vaporization for the material in the tank. Heat-input rate divided by latent heat gives the rate at which the contents of the tank are vaporized. Then, knowing the vapor rate and its temperature, a valve can be selected to protect the tank at any desired pressure.

The first step—the estimation of the heat-input rate — may be but little better than an educated guess. A few recommendations have been published. (1), (2), (3), (4). It is beyond the intended scope of this paper to do other than cite these references.

After you have decided upon a heat-input rate, the methods proposed in this paper will make the selection of venting equipment for petroleum products as simple and direct as possible. We start with a unit heat-input rate—1,000,000 Btu/hour. For low-pressure tanks, we show factors giving the air-equivalent venting rate. For high-pressure tanks, the factors give directly the relief valve nozzle area. These factors are special groupings of physical or thermodynamic properties. They do the work—once and for all—of combining heats of vaporization, density, vapor pressure, etc., to obtain vent-sizing data.

Our starting point in this work was a reference to such a factor in the NFPA Handbook of Fire Protection (4). They refer to a typical straight-run gasoline from Mid-Continent crude oil. "From the analysis of the distillation characteristics of the typical gasoline, the maximum rate of vaporization, expressed in terms of cubic feet per hour, was found to be numerically equivalent to one-sixtieth of the heat-absorption rate expressed in B.t.u. per hour per sq. ft. of cylindrical tank surface." They used a vapor specific gravity of 2.5. For our unit heat-input rate of 1,000,000 Btu/hour, this gives an air-equivalent venting rate of:

$$1{,}000{,}000 \times \frac{1}{60} \times \sqrt{2.5} =$$

26,300 cu. ft./hr.

This is approximate, since the correction for vapor temperature was not made.

We desired first to examine the derivation of this factor; and then in the course of so doing, to obtain similar factors for other materials and pressures. Finally, the results should be expressed in terms convenient for valve sizing. Vents for atmospheric tanks are rated by their manufacturers in terms of the number of cubic feet of air they will pass per hour at various pressures. For this reason, we have expressed the venting capacity required for low-pressure tanks in terms of air-equivalent venting rate.

Derivation for Atmospheric Storage Tanks

GIVEN: A low-pressure petroleum storage tank, within which its liquid contents are being boiled. The heating input rate is arbitrarily selected.

FIND: The air-equivalent venting rate; i.e., the rate of air flow measured at standard conditions, which when flowing through a given orifice at 60° F. will cause the same pressure drop as would the vapors actually flowing from the tank.

$$Q = \frac{H}{L}(V_G - V_L)\frac{P_G}{P_S}\sqrt{\frac{Z_A T_S M_G}{Z_G T_G M_A}} \quad \ldots\ldots(1)$$

Where: Q = air rate equivalent to the vapor rate leaving the tank, cu ft/hr
H = heat-input rate, Btu/hr
L = Latent heat of vaporization at atmospheric pressure, Btu/lb
V = Specific volume, cu ft/lb
P = Pressure, psia
Z = Perfect gas deviation factor
T = Temperature, °R = °F + 460
M = Molecular weight

Subscript: G refers to the vapors in the tank
L refers to the liquid in the tank
S refers to standard conditions
A refers to air

Where no subscript appears, reference is made to vapors in the tank.

In equation 1, the ratio H/L gives the weight rate at which vaporization occurs. The term $(V_G—V_L)$ expresses the number of cubic feet of vapor leaving the tank per pound of material vaporized. The ratio P_G/P_S corrects this volume from tank pressure to standard pressure. The radical term can be considered as a correction factor to convert the

volume rate of actual vapors to its equivalent rate of air flow.

Equation 1 expresses a heat balance to which factors have been applied to make the answer come out in the desired terms. It has been assumed that all of the heat is absorbed in the latent heat of vaporization; and none of the heat contributes toward superheating the vapors, or in chemical changes such as cracking. With this limitation, equation 1 is completely rigorous—but awkward to work with. Considering that we are dealing with low pressures, the following approximations can be made:

$$Z_A = Z_G = 1$$

$$V_G - V_L = V_G = \frac{RT_G}{M_G P_G}$$

The following numerical values are used:

$T_S = 520°R$
$P_S = 14.73$ psia
$R = 10.71$
$M_A = 28.966$

Substituting the foregoing into equation 1:

$$\frac{Q}{H} = 3.08 \times \frac{T}{LM} \sqrt{\frac{M}{T}} \quad \ldots\ldots\ldots (2)$$

The term Q/H is the ratio we desire to evaluate. It gives directly the air-equivalent venting rate per unit heat-input rate. The product LM is the molal heat of vaporization. The group T/LM will be recognized as the reciprocal of Trouton's ratio, LM/T. For many substances at their atmospheric boiling points, Trouton's ratio has a value of about 21. A more refined value of Trouton's ration may be obtained from the Kistiakowsky equation (5):

$$\frac{LM}{T} = 7.59 + 4.571 \log T \quad \ldots\ldots (3)$$

This equation reflects the observed fact that the value of Trouton's ratio increases with the boiling point. It is in good agreement with data for a wide range of non-polar substances.

Equation 2 can now be written as:

$$\frac{Q}{H} = \frac{\sqrt{M/T}}{2.464 + 1.484 \log T} \quad \ldots\ldots (4)$$

Watson and Nelson (6) have correlated molecular weight and boiling point for petroleum hydrocarbons. They introduced a special modulus to characterize whether the material is paraffinic (high values of "K") or aromatic (low values of "K"). Using their correlation to eliminate molecular weight from equation 4, Figure 1 was constructed. It shows the ratio Q/H as a function of temperature; i.e., the boiling point of the liquid, and of the Watson and Nelson characterization factor, K. An imperical line is shown which we propose for general use.

The equation for this imperical relationship is:

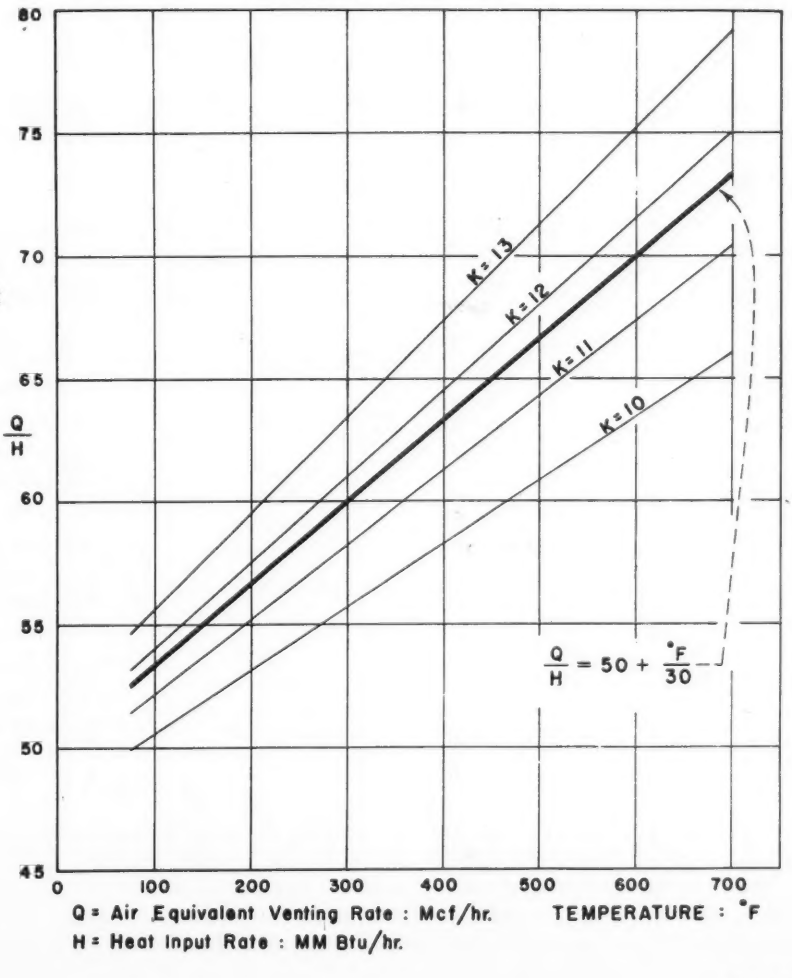
$$\frac{Q'}{H'} = 50 + \frac{t}{30} \quad \ldots\ldots\ldots\ldots (5)$$

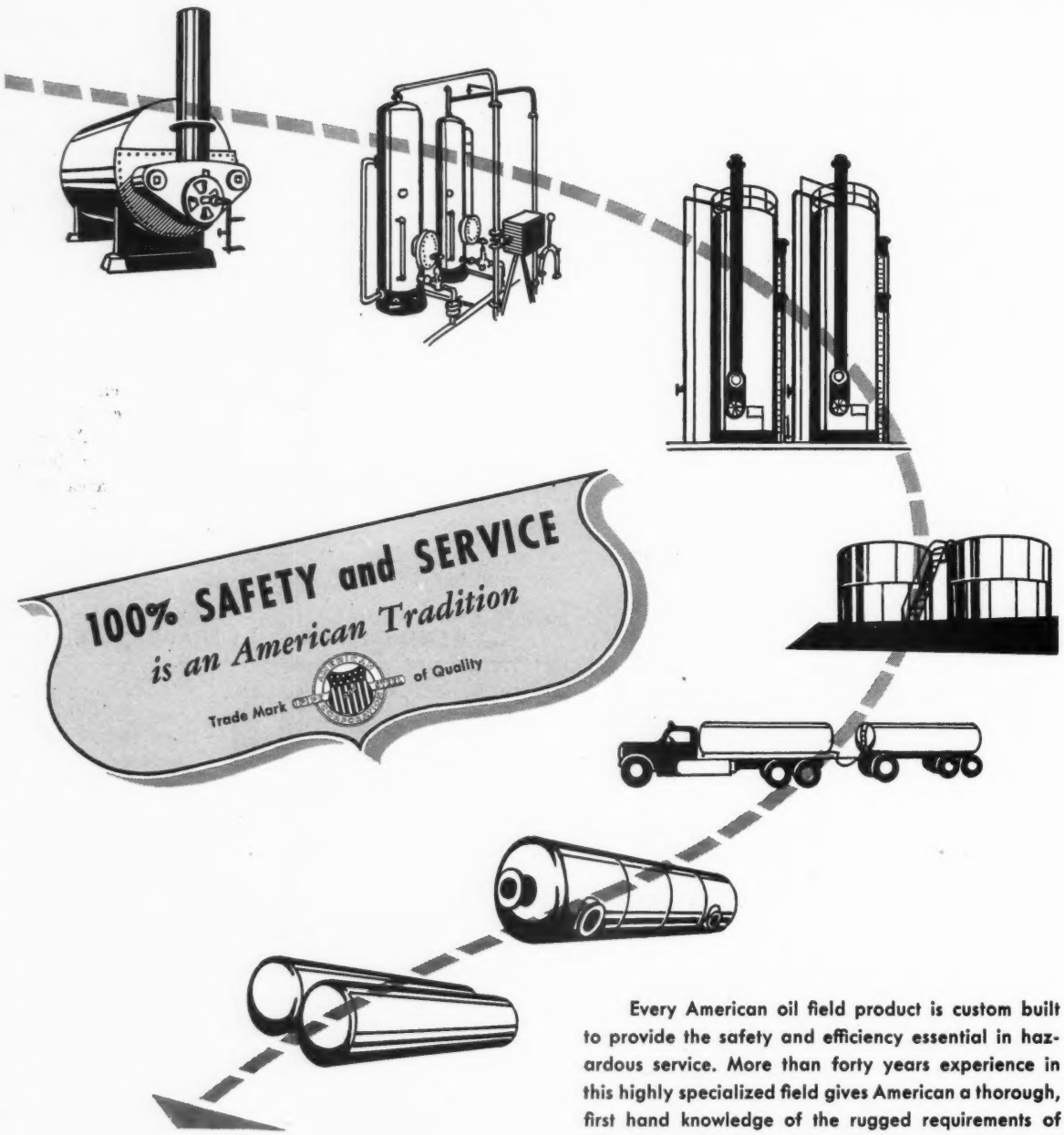
Where: Q' = air-equivalent venting rate, Mcf/hr
H' = heat-input rate, MM Btu/hr
t = boiling point, °F

It is evident from equation 5 and Figure 1 that values of Q/H increase with temperature. Then, other things being equal, a larger vent would be required for a high-boiling material than for a low-boiling material. This raises the question as to what temperature to use in the case of a mixture having a wide-boiling range.

As the contents of a tank containing a wide-boiling mixture are boiled away, two things happen: (1) The temperature increases and the "Q/H" ratio increases in accordance with equation 5; (2) the liquid contents of the tank decrease, thereby decreasing the area exposed to flame, and decreasing the heat-input rate to the tank. In general, the second of these effects will control. As boiling progresses, the liq-

FIG. 1 ATMOSPHERIC STORAGE VENTING





Of necessity, even standard American products are *Custom Built,* and there is no satisfactory substitute for this superior construction in-so-far as quality, safety, serviceability, and ultimate economy are concerned.

Every American oil field product is custom built to provide the safety and efficiency essential in hazardous service. More than forty years experience in this highly specialized field gives American a thorough, first hand knowledge of the rugged requirements of oil field and related products, plus the facilities and ability to fully meet these demands.

American equipment of various types supplies the high factors of safety, efficiency, and economical operation required for modern petroleum production, refining and transportation, and have performed faithfully through years of continuous, uninterrupted service. Their performance records are readily available, and leave no room for doubt as to their supremacy.

AMERICAN PIPE & STEEL CORPORATION

engineers designers fabricators

ALHAMBRA, CALIFORNIA, U.S.A.
CABLE ADDRESS: AMPSTEEL

uid volume and total heat-input rate will decrease faster than the temperature "Q/H" ratio increase. The initial boiling point on the distillation curve should ordinarily be used for "t" in equation 5. An exception to this would be a high-boiling material containing a small percentage of a low-boiling fraction. The front of the distillation curve of such a blend would be abnormally steep. Another exception occurs in the case of large tanks if the formula used for heat-input rate considers only the surface up to a stated elevation above grade. Liquid in a tank above this elevation would have to be boiled off before any reduction in heat input were allowed. For example, if a tank can be filled to 40 feet, and if the walls of the tank only up to 30 feet were considered for heat input, then the 25-per cent point on the distillation curve should be used for "t" in equation 5.

If the tank is to operate under a slight pressure—say up to 15 psig—equation 5 can be used in the following manner. For "t" in equation 5, use the boiling point of the material at atmospheric pressure. This will introduce small errors into the values of "L", "V", and "T" of equation 1. The net error due to pressure can be corrected by increasing the value of "Q'/H'" obtained from equation 5 by 1¼ per cent for each pound per square inch pressure above atmospheric. For example, for a pressure of 10 psig, multiply equation 5 by 1.125.

Derivation for Pressure Storage:

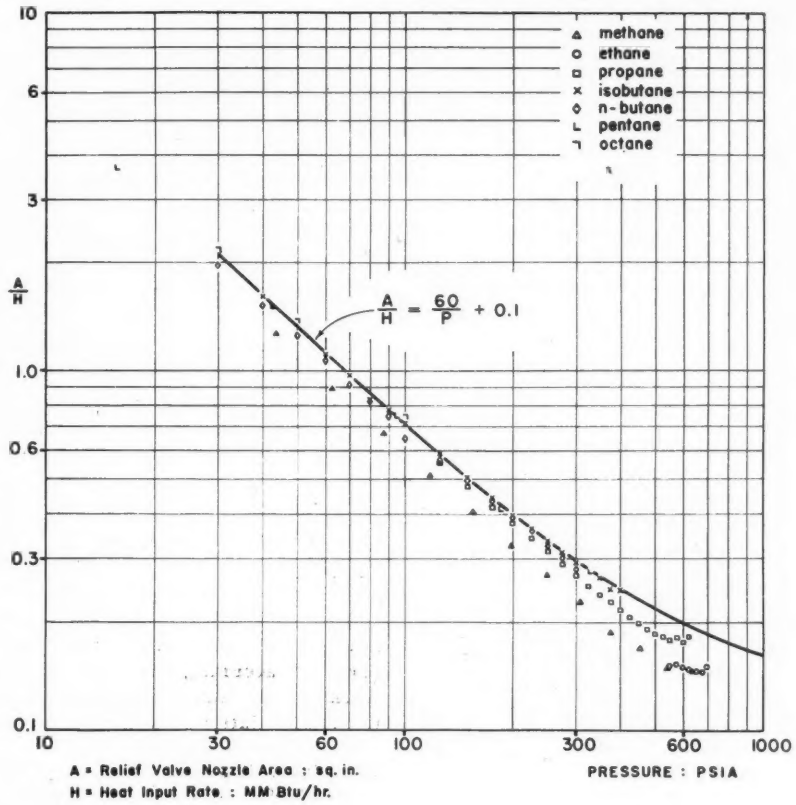
GIVEN: A pressure-type petroleum storage vessel, within which its liquid contents are being boiled. The heat-input rate is arbitrarily selected.

FIND: The relief valve nozzle area necessary to discharge the vapors.

The following is the formula for relief valve capacity from the API-ASME Code for Unfired Pressure Vessels (7). It has been modified by the inclusion of the perfect gas deviation factor:

$$W = 306\,AP\sqrt{\frac{M}{ZT}} \quad \ldots\ldots\ldots(6)$$

FIG. 2 PRESSURE STORAGE VENTING



Where: W = Weight rate of flow through relief valve, lb/hr
P = Pressure at valve inlet, psia
T = Temperature at valve inlet, °R = °F 460
M = Molecular weight of vapors
Z = Perfect gas deviation factor at valve inlet
A = Relief valve nozzle area sq in

$$W = \left(\frac{H}{L}\right)\left(1 - \frac{V_L}{V_G}\right) \quad \ldots\ldots\ldots(7)$$

Where: H = Heat-input rate, Btu/hr
L = Latent heat of vaporization, Btu/lb
V_G = Specific volume of vapor in tank, cu ft/lb
V_L = Specific volume of liquid in tank, cu ft/lb

The ratio H/L gives the weight rate at which boiling occurs. The term $(1—V_L/V_G)$ is the fraction of total material vaporized which leaves the vessel.

By definition,

$$Z = \frac{P\,V_G\,M}{RT} \quad \ldots\ldots\ldots\ldots(8)$$

Where: R = gas content = 10.71

Equation 6 may be re-arranged and values substituted from equations 7 and 8:

$$\frac{A}{H} = \frac{1}{1001\sqrt{PV_G}} \times \frac{V_G - V_L}{L} \quad \ldots(9)$$

The ratio A/H may be considered as a multiplier to apply to heat-input rates to obtain a required relief valve area. Equation 9 may be evaluated in the following ways:

a. For any material for which tables of thermodynamic data are available, substitutions may be made from the tables directly into equation 9.
b. The group PV_G may be evaluated from correlations of perfect gas deviation (8). The second group of the equation, $(V_G—V_L)/L$, may be recog-

nized as a part of the Clausius-Clapeyron equation, from which:

$$\frac{V_G - V_L}{L} = \frac{K}{T} \times \frac{1}{(dP/dT)} \quad \ldots\ldots(10)$$

Where: K is a constant to make the units of the equation consistent. (dP/dT) is the slope of the vapor-pressure curve.

The pressure-temperature differential may be evaluated graphically from a vapor-pressure curve. Or, it may be evaluated analytically by the differentiation of an imperical vapor-pressure equation. Such a procedure is described by Hougen and Watson (9) and by Perry (19).

c. The latent heat of vaporization may be obtained in the following manner: Equation (3), the Kistiakowsky equation, will give the latent heat for the material at atmospheric pressure. Correlations between latent heat and pressure are available, (8) (10). These relationships may be used to obtain a correction factor to correct the latent heat at atmospheric pressure to that at the desired pressure. The specific volumes may be obtained as in (b) above (11).

We evaluated equation 9 by methods (a) and (c). By method (a), we calculated "A/H" using Sage and Lacey tabulated data for methane (12), ethane (13), propane (14), isobutane (15), n-butane (16), and n-pentane (17). By method (c), we calculated A/H for octane at 30, 50, and 100 psia and for pentane at 42 and 95 psia, using Edmister's correlations (8). The points for pentane calculated by method (c) agreed very closely with those obtained by method (a). The results of these calculations are plotted on Figure 2, against pressure. A consistent relationship was found which we recommend for general use. It is represented by the following imperical equation:

$$\frac{A}{H'} = \frac{60}{P} + 0.1 \quad \ldots\ldots(11)$$

Where: A = Relief valve nozzle area, sq in

H′ = Heat-input rate, MM Btu/hr

P = Pressure in tank, psia

The L.P.G. Safety Orders of the California Department of Industrial Relations give the following formula for relief valve area (18):

$$A = \frac{0.77\,a}{p + 15} \quad \ldots\ldots(12)$$

Where: a = Surface area of vessel, sq ft

p = Working pressure of vessel, psig

A comparison can be made between equations 11 and 12. This is expressed in the following table in terms of the heat-input rates which, when used with equation 11, will give the same relief valve size as equation 12. Two sets of figures are given, depending upon whether equation 12 is construed to apply to the pressure at full valve capacity (i.e., no accumulation) or to the working pressure plus 50% pressure accumulation.

Heat Input Rates Which When Used in Equation 11, Will Give the Same Relief Valve Area as Equation 12

	Accumulation	
Pressure	0%	50%
30 psia	12,200 Btu/hr	14,640 Btu/hr
50 psia	11,830 Btu/hr	15,450 Btu/hr
80 psia	11,300 Btu/hr	15,500 Btu/hr
200 psia	9,620 Btu/hr	13,920 Btu/hr

Equation 11 accomplishes for pressure storage the same thing equation 5 accomplishes for atmospheric storage. Both are expressed as simple functions of a single easily obtained variable. Both give valve-sizing data in convenient units for selecting venting equipment; and both are expressed in terms of a unit heat-input rate of 1,000,000 Btu/hour.

BIBLIOGRAPHY

Ref. No.	Page No.	Reference
1	1	"The Determination of the Relief Dimensions for Safety Valves on Containers in which Liquefied Gas is Charged and When the Exterior Surface of the Container is Exposed to a Temperature of 1200° Fahr.," by John C. Fetterly, Bureau of Explosives, 30 Vesey St., New York City, November, 1928.
2	1	"Wartime Recommendations of the Safety Valve Standardization Conference," Office of the Petroleum Administrator for War, Washingington, D.C., January, 1943.
3	1	"Requirements for Relief of Overpressure in Vessels Exposed to Fire," by J. J. Duggan, D. H. Gilmore, and P. F. Fisher. Trans. A.S.M.E.
4	1, 2	Crosby-Fiske-Forster Handbook of Fire Protection, National Fire Protection Association, Boston, Mass., Ninth Edition, 1941, page 107.
5	4	Kistiakowsky, Z. Phys. Chem., 107, 65-73 (1923).
6	5	K. M. Watson and E. F. Nelson, Ind. & Eng. Chem., 25, 880 (August 1933).
7	6	K. S. M. Davidson and D. W. MacArdle, Oil & Gas Journal, Aug. 29, 1929.
8	7	W. C. Edmister, Petroleum Engineer, 17, pages 79, 130, 211, (March, April, May, 1946). California Oil World, second issue November, and first issue December, 1945.
9	8	Hougen and Watson, "Chemical Process Principles," John Wiley & Sons, New York, 1943, page 230.
10	8	Gouq-Jen Su, Ind. & Eng Chem., 38, 923 (Sept., 1946).
11	8	K. M. Watson, Ind. & Eng. Chem., 23, 360 (April, 1931).
12	8	Corcoran, Bowles, Sage, and Lacey, Ind. & Eng. Chem., 36, 825, (Sept., 1945).
13	8	Sage, Webster, and Lacey, Ind. & Eng. Chem., 29, 658, (June, 1937).
14	8	Sage, Shaafsma, & Lacey, Ind. & Eng. Chem., 26, 1218, (Nov., 1934).
15	8	Sage & Lacey, Ind. & Eng. Chem. 30, 673, (June, 1938).
16	8	Sage, Webster, & Lacey, Ind. & Eng. Chem., 29, 1188, (Oct., 1937).
17	8	Sage & Lacey, Ind. & Eng. Chem., 34, 730 (June, 1942).
18	9	"Liquefied Petroleum Gases Safety Orders," State of California, Department of Industrial Safety, California State Printing Office, Sacramento, 1946.
19	8	Perry, "Chemical Engineers Handbook," Second Edition, Page 732, McGraw-Hill, New York, 1941.

Sespe Test Running Pipe

Eagle Rock Petroleum Co. is running 12½-in. casing in its Eagle Rock No. 1 test well in Sec. 36-5n-20w in the Sespe area, Ventura County. Republic Operators, Inc., has its Arundell No. 6-1 in Sec. 6-4n-19w rigged up to deepen. Present depth is 4010 ft.

LAUGH THIS OFF!!

The nudists were planning a costume party and the ladies were worrying over what to wear. "Well," said one, "with my varicose veins, I think I'll go as a road map."

He had hung around the house all evening sampling papa's wine and using up the juice on the radio.

Finally he made this flat statement to the girl friend—"I'm going to kiss you."

Her reply — "Well, do it while I'm still young."

Pa: "It's 2 o'clock, about time that Sally's boy friend went home."

Ma: "Now, Pa, remember how we used to court."

Pa: "That settles it. Out he goes."

"I turned out the lights — now let's pretend we're in heaven."

"But, honey. I'm no angel."

"I know — that's why I turned out the lights."

"Miss Brown," said the colored parson as he led her into the brook for baptism, "I'se gwine to wash out every spot of sin you's got."

"Lawsy, Parson," she giggled, "in dat li'l ole shallow creek?"

"Fill 'er up with what sir? Gas, Oil, Water, Coal or Wood, sir?"

The laziest man in California stands with a cocktail shaker in his hand and waits for an earthquake.

A sailor, just home from a long cruise, rushed to a phone and called his girl friend. In a few minutes he came out of the booth looking very bewildered.

"She's gonna get married," he told a pal.

"Aw, forget it," advised the pal. "There's lotsa girls."

"Yeah," replied the sailor, "but she's gonna marry me."

The Nation of London reported that inside "the Town Hall of London Borough" the following notice was posted: "Owing to the fuel crisis, officials are advised to take advantage of their typists between the hours of 12 and 2."

Every parent at some time or another suffers acute embarrassment at some expression uttered by an offspring — that's why we think mammas and papas will appreciate this true story of a small girl. She was doing her homework in arithmetic, and her parents suddenly realized the young 'un was murmuring: "Four and two, son of a b.., six. Three and five, son of a b.., eight."

After a pantomine between parents of raised eyebrows and shoulders shrugged in bewilderment, her mother casually asked: "What are you saying, dear?" The little girl said: "Just what the teacher told us, mummy. Seven and three, son of a b.., ten."

Well, the parents said no more, but the next day the mother dropped in at the school to ask her daughter's teacher what it was all about. After recovering from the initial shock, the teacher thought for a while and then went into spasms of laughter. "I've got it," she said, wiping her eyes. I've been saying to the class: "Four and three, the sum of which is . . ."

A wolf is like a train—a girl likes to hear the whistle even if she isn't going anywhere.

A gal and an automobile are much alike. A good paint job cancels the years, but the lines tell the story.

Does JENSEN Offer Something for Nothing?

Maybe it depends on how you look at it. Actually, there's no such thing as "something for nothing" in the oil business. But Jensen does offer you more value for your money.

To begin with, you have a low initial cost when you buy a Jensen Pumping Unit. And there's a real saving in Jensen's lower maintenance costs, reduced power bills, and less "down time."

Let your Jensen dealer show you how Jensen's extra values can make more profits for you. See him today.

Stocked by
THE OIL TOOL CORPORATION
3075 Cherry Ave., Long Beach, Calif.
Phone 481-81

JENSEN BROTHERS MFG. CO.
COFFEYVILLE, KANSAS, U.S.A.
EXPORT OFFICE, 50 Church St.
New York City

Personalities IN THE NEWS

Beesemyer and Magruder Elected Exec. Vice Presidents At G. P.

Election of Clarence S. Beesemyer and Philip S. Magruder as the company's executive vice-presidents was announced recently by R. L. Minckler, president of the General Petroleum Corporation, at the concern's home office in Los Angeles.

Both men have been vice-presidents and directors of General Petroleum, with Mr. Beesemyer serving as director of marketing and Mr. Magruder as manager of the manufacturing department.

Mr. Beesemyer, who was 1947 president of the Los Angeles Chamber of Commerce, the nation's largest organization of its kind, has spent his entire business career on the Pacific Coast. He entered the oil business in 1912 as a general worker, progressing through various promotions to become vice-president and a director of the A. F. Gilmore Co. in 1918. In 1923, following a merger, he became vice-president and director of the Gilmore Oil Co. He was elected president of Gilmore in 1944 and in 1945, when Gilmore was taken over by General Petroleum, became director of marketing and a vice-president of General Petroleum.

Mr. Magruder joined General Petroleum in 1925 as a tester at the concern's Vernon plant. Subsequently he became a gas engineer at Santa Fe Springs, returning to Vernon in 1929 as general superintendent of the gas department, followed by advancement to assistant manager, manager and member of the manufacturing committee. He transferred to the company's home office in 1945 and soon thereafter was made manager of the manufacturing department. In 1945 he was elected a director and, the following year, a vice-president.

The above photograph was taken at the Dunlap and Graham Christmas party which was attended by several hundred oil men. In the photograph left to right are: Bob Gentry, Mgr., Long Beach Oil Dev. Co., Lynn Hassam, Attorney, Hancock Oil Co., D. D. Dunlap, Bill Webb of Hellman Estates, Eddy Fry, drilling foreman, Shell Oil Co., Long Beach.

M. O. Johnston, Jr., Rejoins Organization

M. O. Johnston, Jr.

M. O. Johnston Oil Field Service Corporation announces that M. O. Johnston, Jr., is now in charge of outgoing and incoming supplies and equipment at the Main Office and Plant in Los Angeles, California.

After graduating from Southern Methodist University M. O. Johnston, Jr. spent some time with the Johnston Corporation at Los Angeles. During the war he served in the Marine Corps and saw action at Guadalcanal, Saipan and Guam. At the end of hostilities he returned to the Corporation's employ and recently has been on a leave of absence taking specialized business training preparatory to assuming his new duties.

Promotions Made at Texas Co.

Promotions in the production department of The Texas Company, effective January 1, 1948, were announced by James T. Wood, Jr., manager of the company's producing operations in California.

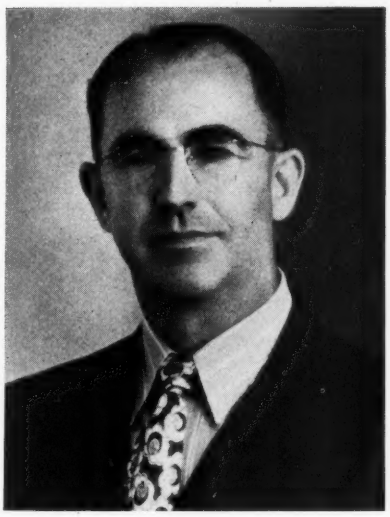
In the Engineering Division, T. W. Bell changes from District Engineer Fellows District to Division Engineer with headquarters in Los Angeles. W. F. Cory from Development Engineer Los Angeles Basin District to District Engineer Fellows District. L. E. Chatfield from Production Engineer Fellows District to District Engineer Sacramento District. O. W. Chonette from Production Engineer Los Angeles Basin District to District Engineer Los Angeles Basin District, and F. W. Maloney from Produc-

tion Engineer to District Engineer Ventura District.

In the Production & Drilling Division, R. L. Patton changes from District Engineer Ventura District to Assistant Superintendent Ventura District.

Milo Webb Heads World Supply Co.

Milo P. Webb has been appointed head of World Supply Company, a newly formed oil field equipment rental agency. The new firm will offer Southern California drillers a complete line of oil field drilling equipment on a rental basis. Specializing in small sizes of drill pipe and drill collars, other drilling equipment from reliable manufacturers will be available for immediate delivery.



Milo Webb

Well known to the California oil industry, Milo Webb brings to World Supply Company an intimate knowledge of equipment operation gained in over twenty-eight years of practical field and sales experience. Starting in the Kern River field in 1919, he made the first booms in Huntington Beach and Signal Hill, working for most of the major oil companies and several of the early drilling contractors. For the last fifteen years he has been on Cherry Avenue's supply row, handling drill pipe and drilling equipment and helping pioneer power rigs in California. His new headquarters, with World Supply Company, will be 2104 E. Spring Street, Long Beach, California.

J. C. Sample **C. M. Wagner** **A. L. Donnelly** **G. L. Adams**

G. P. Advances Four to Top Executive Positions

Election of four General Petroleum Corporation executives to new offices in the company was announced recently by R. L. Minckler, president, at the concern's home office in Los Angeles.

John C. Sample, former general sales manager, became a vice-president as did Arthur J. Donnelly, industrial relations manager. Gale L. Adams, manager of the manufacturing department, was named a vice-president and director; and Carroll M. Wagner, manager of the geological department, likewise was chosen a director.

Mr. Sample was transferred to General Petroleum from the Standard-Vacuum Oil Co. in 1938 after 17 years service in Japan and Korea, where he advanced to assistant division manager. He became assistant manager of the marketing department of General Petroleum in 1941 and general sales manager in 1943. He is a director of the company. Mr. Sample is a graduate of Indiana University.

Mr. Donnelly entered General Petroleum service in Seattle in 1924. Subsequently he advanced through various sales positions at Oakland, Los Angeles and Portland and became Northern California division manager in 1933, remaining in the San Francisco offices until 1944 when he went to the home office as manager of industrial relations. He was elected to the board of directors in 1945. His entire business career has been spent with the company.

Mr. Adams joined the laboratories department of the company in 1925, subsequently serving as a chemical engineer, supervisor of process laboratories, assistant manager of the laboratory department, manager of that department and assistant manager of manufacturing. He is a member of various petroleum industry committees and was president of the student body in his senior year at the Michigan College of Mines.

Mr. Wagner, fourth member of the quartet, is manager of the company's geological department. He joined General Petroleum in 1919 as a field geologist, becoming assistant manager of the department in 1926 and manager in 1932. In addition to extensive travels in the United States in connection with oil and gas exploration, during which he has participated in the discovery of numerous oil fields in California and the Rocky Mountain states, he has participated on behalf of Socony-Vacuum in the exploration or development of oil fields in Canada, Mexico, Argentina, Venezuela and Colombia.

Election of Clyde Campbell as vice president and field superintendent for Buaas Drilling Corp. in Bakersfield, has been announced.

Joe Gowen, formerly branch manager for Signal Oil Co. at Long Beach, has a new assignment as division superintendent of sales training for the Southern division.

The executive Club of Fresno, a branch of the Associated Clubs of America, was formed recently with A. C. Guske and Oliver Howell of Shell Oil Co. as members of the organization committee. The first meeting of the new group had Randolph Churchill, publicist and son of the former prime minister of Great Britain, as speaker. After the meeting, Churchill and officers of the club were guests at the Guske home.

Nomads December Meeting

The Los Angeles Chapter of Nomads held its annual business meeting December 10, 1947 at the Jonathan Club. Called to order at 8:30 PM, by President Bob Eiche, the meeting was limited to members only.

As a result of the scouting efforts of Nomad Lee Laird, the membership was treated to the talents of a beautiful accordian-playing troubador who led the group in singing of a number of old-time favorites.

Five of the new associate members elected at the November meeting were inducted into the Chapter. Nomad Elmer Decker introduced the new members and presented them with certificates and pins—following which President Bob Eiche welcomed them into the organization.

Nominations for officers for the coming year were brought in by the Nominating Committee. Following a nomination from the floor by Nomad John Mason for Earle Boggess as president, it was moved and seconded that nominations be closed.

Nominations are as follows:

President, Fred Ripley — Earle Boggess; Vice-President, Lee Laird; Secretary, Byron Landis; Treasurer, B. Reinhold; Sgt.-at-Arms, Earle Boggess; Asst. Secretary, George Flanders; Asst. Treasurer, John Flanagan; Dep. Sgt.-at-Arms, Jerry Engstrand.

Ballots have been mailed and will be counted at the January 14th meeting.

Because 1948 will be an unusually important year to Nomads in view of the forthcoming International Petroleum Exposition at Tulsa in May it was suggested by Nomads Ox Morgan and Ernie Fowks that qualifications of new candidates for office be weighed carefully before voting. The extent to which a candidate travels in the Mid-Continent and how much time he will be able to devote to the oil show should be considered.

Other business conducted included a financial report and a report to the effect that the Board of Regents in Chicago has accepted Ned Brown, new president of the American Association of Oilwell Drilling Contractors as Honorary Member of the Los Angeles Chapter of the Nomads, and that he will be presented with his pin upon his return from a business trip in Arabia.

Assistant Treasurer B. Reinhold requested that he be supplied with additional names of persons in European countries to whom CARE packages may be sent. So far only 30 packages have been sent out of the 75 packages which the Chapter has committed to send. Names of qualified persons should be submitted at once to Mr. Reinhold by telephoning KImball 8131.

To complete the photographing of all Nomads in the Chapter, Hal Coops, Chapter photographer, volunteered to contact members and arrange to have photographs taken in their offices or wherever convenient.

Nomad Ted Sutter reported that a reception committee will be appointed to serve at the Tulsa oil show, but urged that other Nomads who expect to attend the show should so advise the committee in order that their services may be utilized. He also informed the group that the first Nomad publication will be brought out at the show and that shortly thereafter it is anticipated that the first of a regular quarterly publication will be brought out.

Pictured are five new associate members, Los Angeles Chapter of Nomads, being inducted by Elmer Decker. Left to right: J. Howard Tinkham, Dick Sneddon, John Regan, Vernon Mitchell, Kinzie Miller and Elmer Decker.

Dr. Davis Retires From Shell

Dr. A. F. Davis, vice president of Shell Oil Company, Incorporated, and the Company's chief consulting geologist for the North American continent retired January 1 after nearly 30 years' service, according to an announcement by S. Belither, executive vice president.

Dr. Davis long career covered a period of achievement and growth. Shell's holding in many California oil fields were obtained during this time. One of these producing areas was Ten Section Field in Kern County, the first California oil field to be located entirely by seismic methods. Many other advances were in petroleum technology, enabling men to drill deeper and recover larger proportions of oil from each field.

Dr. Davis attended the University of California where he obtained his Ph.D. in 1917. Shortly thereafter he joined Shell in New Mexico and came to California in 1922 as chief geologist, a position he held until 1929 when he was elevated to vice president and chief geologist. In 1940 he succeeded the late J. U. Stair as vice president in charge of the Los Angeles office. Dr. Davis continued in this capacity until December 1, 1944 when in addition to his vice-presidential duties he became chief consulting geologist for the North American continent.

Dr. and Mrs. Davis will continue to reside in Southern California.

Orella Wildcat Ready For Test

Shell Oil Co. has plugged back from total depth of 4887 ft. to 4010 ft. in its Careaga No. 2-1 wildcat in Sec. 36-5n-31w in the Orella area in Santa Barbara County and is ready to inaugurate tests. The company has made location for its Schieferle Heirs No. 2, an outpost well in Sec. 17-3n-20w in the South Mountain area, Ventura County.

Candid Shots Taken at the Petroleum Production Pioneers Year-end Get-Together.

Ryburn Advanced By National Supply

W. R. Ryburn has been appointed Manager, Drilling Equipment Sales of the Oil Field Machinery and Equipment Division, National Supply Company, according to an announcement made by R. W. Gordon, Manager, Oil Field Sales. Mr. Ryburn will make his headquarters in Toledo, Ohio. He joined the company in 1928 and served in the capacities of Store Man in National Supply's Shelby and Conrad, Montana stores and as Field Salesman in their Casper and Cody, Wyoming stores. In 1938, he was transferred to the General Sales Department at Toledo.

W. R. Ryburn

Upon leaving the University of Michigan, Mr. Ryburn was employed in the Land and Lease Department of The California Company in Montana and worked for various drilling contractors in Montana and Wyoming from 1924 to 1928.

John W. Brown and B. De Lorenzo of Brown Fintube Co. discussed "Application of Extended Surface Heat Exchangers" at the dinner meeting of the California Natural Gasoline Association at the Rio Hondo Golf Club. Mr. Brown is president of Brown Fintube and a graduate of Harvard University. B. De Lorenzo, who is the company's chief engineer, at one time was in the heat transfer division of Alco. He is a graduate of the Massachusetts Institute of Technology.

Promotions in G. P. Production Department

Three promotions in the production department of General Petroleum Corporation were announced recently by R. O. Swayze, manager of the company's California production operations.

J. J. Oliphant becomes production superintendent of the San Joaquin Division with headquarters at Taft; C. C. Gandaubert was named assistant superintendent for the Southern Division with offices at Vernon; and A. L. Hair was appointed drilling superintendent for the same division, stationed at the concern's Wilmington production office.

Mr. Oliphant, lately assistant to the division superintendent at Taft, was first employed by G. P. in 1929 as a clerk in the production department at Vernon.

Mr. Gandaubert, recently drilling foreman in the Southern Division, first worked for the company as a roustabout at Ventura in 1920 and progressed through the ranks to drilling foreman at Santa Fe Springs in 1928.

Mr. Hair's first job with the company in 1920 was that of rotary helper and, like Mr. Gandaubert, he became a drilling foreman in 1928 at Santa Fe Springs. At the time of his new appointment, he was drilling foreman in the Coastal Division at Ventura.

Dick Newby, Avenal engineer for the Southern California Gas Co., has rejoined the Army Air Corps and has reported for duty at San Antonio, Tex.

Ross Cabeen and E. G. Bemis took care of the geology and engineering on the well recently brought to successful conclusion by Guy H. Cherry, Jr., at Santa Maria Valley.

Appointment of Earl Montgomery, former Coast division sales manager for Douglas Oil Co., to manager of the lubrication and oil division, has been announced by Director of Sales, Sam Golman. Montgomery has been associated with the gasoline industry for more than 20 years.

Mr. W. A. Miller has been elected Secretary and Treasurer of Lane-Wells Company, succeeding Miss B. G. Peters, who has retired after fifteen years of service.

Mr. Miller joined Lane-Wells in 1945 after 5½ years service in the Army Air Force where he attained the rank of major. He has been Chief Statistician since January 1, 1946, and, in addition to his new duties as Secretary and Treasurer, will continue to head the Statistical Section. Mr. Miller will report to Mr. D. S. Jeppson, Vice President and Controller.

Basil Wolverton and his "spaghetti and meatball" type of caricatures are credited with attracting widespread attention to Hancock Oil Co. advertisments in various kinds of printed media. It was the comic strip "Li'l Abner" that gave Wolverton his start in this type of art with a nationwide contest aimed at uncovering the most "horrible" drawing of Lena the Hyena.

Wolverton's entry won out over many thousands of other weird and unusual pictures of every type. Life magazine soon thereafter featured other examples of his work, which included a two-page spread devoted to the glowering face of John L. Lewis. It was the huge intertwining eyebrows and rough complexion of this masterpiece which gave the drawings their "spaghetti and meatball" label.

President Thomas Wyatt Simmons of Bolsa Chica Oil Corp. left Los Angeles January 7 for an extended tour of South American points. His itinerary includes Buenos Aires, Rio de Janeiro, Lima, Santiago and Valparaiso.

Union Pacific Shows Faith in West

Horace Greeley said it, but it took two World Wars and the foresighted planning of one of the nation's leading railroads to bring his advice to jell.

Prompted by increased westward expansion of men who listened to Greeley's famed "Go West, Young Man," the late E. H. Harriman rebuilt the Union Pacific Railroad shortly after the turn of the century.

Today, because of wartime experiences and an ever increasing faith in the continued growth of the west, Union Pacific again is virtually rebuilding--this time under the direction of President George F. Ashby and E. Roland Harriman, chairman of the Union Pacific Board of Directors—a son of E. H. Harriman.

Already, nearly $200,000,000 has been authorized for expenditure, or spent, since V-J Day, for new equipment and fixed facilities to handle the increased flow of passengers, materials and finished products to and from the nation's newest, fastest-growing industrial areas.

With the end of World War Two, students of the history of American Civilization became increasingly aware of two things:

(1) American industry, divorced from the overly-populated East, has gone West and could be counted upon to stay there, and

(2) If that were true, some safe, certain lifeline must be found not only to keep it there but to link it even closer to the populous Eastern and Midwestern Markets.

Union Pacific officials, prompted by experiences of the formative war years as well as the progressive prodding of President Ashby had long planned for just such an eventuality.

The result was that V-J Day found the railroad which first linked the two oceans with the Driving of the Golden Spike on May 10, 1869, ready with a long-range program designed to protect the future of the newly industrialized and increasingly agriculturalized west.

While some railroad critics gave forth with loud ravings about the unprogressive actions and attitudes of the nation's rail heads, Union Pacific's Ashby quietly described himself as "no crepe-hanger" and immediately:

(1) Ordered an institutional advertising campaign in the nation's trade press pointing out the industrial advantages of the west. (Since V-J Day, more than a thousand NEW industries have been located on UP lines).

(2) Began placing the orders for the additional freight, refrigerator and passenger cars he knew would be needed.

(3) Started a purchase program that will result in complete dieselization of the railroad's entire main line from Salt Lake City to Los Angeles early in 1948.

(4) On November 15, 1947, the Union Pacific had 272 diesel units with a total horsepower of 358,980. But on that day Mr. Ashby made railroad history when he ordered and additional 181 diesel power units. When these are delivered the railroad will have 535 diesel units totaling 750,000 horsepower.

(5) Began a long-range construction program that already has resulted in construction of one new freight classification yard at Pocatello, Idaho, and plans for another in Nebraska to speed the flow of freight.

(6) Ordered construction of a new tunnel through the Wasatch Mountains at Aspen, Wyo., which will eliminate the only section of single-track line between Omaha and Salt Lake.

(7) Ordered further centralized traffic control installations to provide faster, safer transportation from coast to coast.

(8) Instigated a new livestock dispatch service eliminating the usual stop for feed, water and rest at Las Vegas, Nev., and putting livestock into Los Angeles from Ogden, Utah, in slightly more than 30 hours.

(9) Placed Union Pacific's entire fleet of five "Cities" streamliners into daily service between Chicago and Los Angeles, San Francisco, Portland and Denver and between St. Louis and Denver.

(10) Insisted that the problem of safer delivery of freight be solved by the employment of a container engineer whose job it is to see that all freight is properly packaged to cut down losses.

(11) Instituted an educational travel program designed to interest America's vast traveling public to the beauties of the west—Sun Valley, The Southern Utah Parks, Yellowstone and the like.

(12) Ordered an all-out effort to keep the railroad's services not only abreast of but ahead of continued development of the Pacific Northwest, California, Idaho and other states served by the road.

(13) Demanded that all this be accomplished by an ever-increasing vigilance against accidents through installation of new safety devices and operation of an exhibition car in which railroaders and the public alike are given lectures on safety and railroad operation.

(14) Ordered the purchase of new type, high-speed 133 pound rail for use in a continuing program of track replacement of the road's main lines.

That, briefly, is the program of expansion and progress now under way on Union Pacific Railroad.

That is the program which Union Pacific's Board of Directors, meeting in Boise, Idaho, during a recent inspection tour, voted to support by adding some $80,000,000 to the money already spent or being spent.

That is the program in Mr. Ashby's mind when he constantly tells friends, associates and newspapermen alike:

"I am an optimist. I believe that the West is in for a long period of prosperity. And that is why Union Pacific Railroad is investing more than $200,000,000 in the future of western industry and agriculture."

Cat Canyon Try Drilling

General Petroleum's Fullerton No. 1 in Sec. 31-9n-32w on wildcat ground near the Cat Canyon field is prospecting on down below 3350 ft.

Oxnard Program

Terman-Frost & Co. of Dallas, Tex., is planning to drill several wells on the Vaca lease in the Oxnard field. Ronnie Smith is the company's California agent.

Kramer Installs First Continental Oil Field Pumping Engine

The first installation in California of a Continental Oil Field Pumping engine has recently been completed in the Huntington Beach field. Oil Well Engine Service Company, of 517 16th St., Huntington Beach, installed the engine, a Continental Model M330. The Oil Well Engine Service Company is the Continental Oil Field engine sales' outlet in Orange County, operating as a dealer for the Anderson-O'Brien Company, Continental Oil Field Distributor recently franchised by Continental Sales and Service Company of 5077 So. Santa Fe Avenue, and well known as the sales outlet for General Motors Diesel engines.

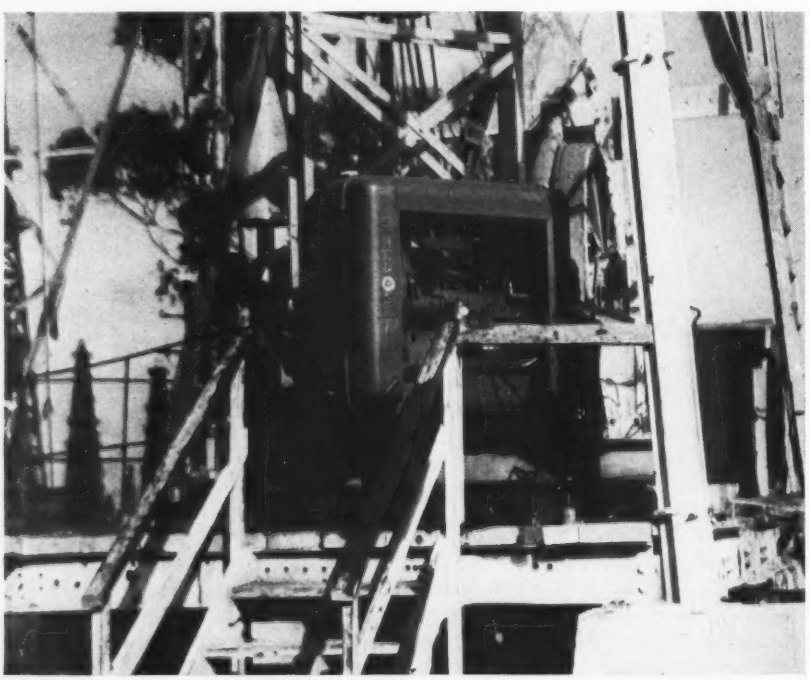
The Huntington Beach installation pictured here was rented, with purchase option, to Lawrence P. Kramer to pump the deepest well in Huntington Beach, formerly owned by the Southern Bell Oil Company. This well, with its easily recognized steel derrick, was drilled to almost 9,000 feet. The pump unit, a Model 58 Lacy Oil Tool "Bulldog", is presently set at 7,240 feet with 2,200 feet of 7/8" sucker rod and 5,040 feet of 3/4" sucker rod. A Neilsen 1R 1-1/4 metal pumper is powered by the M330 Continental, operating at 1,100 r.p.m.

The Continental Oil Field engine is produced in a number of sizes, with model number corresponding to displacement:

Model Y- 69
Y-112
F-162
F-226
M-330
B-427
R-501
R-602
R-749

This wide range of displacement permits the proper choice of engine for any normal pumper horsepower requirement. The Y-69, Y-112 and F-162 are four cylinder models, the remainder being six cylinders.

Two unusual features claimed for the Continental Red Seal engine are "Roto" exhaust valves to prevent valve sticking, and individual intake manifold porting to assure even distribution of the fuel charge. As one of the oldest manufacturers of internal combustion engines, Continental's entry into the oil well pumping field in California will be watched with interest by local operators.



Johnston Gun Perforator Name Change Announced

As a compliment to the men in the field a change in name from "PERF-TEST" to "SHOOT-N-TEST" has been announced by M. O. Johnston Oil Field Service Corporation for their mechanically-operated, hydrostatically-fired gun perforator. The term "SHOOT-N-TEST" has been adopted because it so well describes the function of the Johnston All-Purpose Gun Perforator as the perforating unit in combined perforating and testing operations and the flexibility afforded in running in on tubing or drill pipe. The change in name has been made to better identify the tool to the oil fraternity who have consistently called for SHOOTING TESTS.

Illustrated descriptive literature is available from M. O. Johnston Oil Field Service Corporation, 3035 Andrita Street, Los Angeles 41, California.

New Bridging Plug

A new bridging plug has been perfected by International Cementers, Inc. which should be of great interest to drillers and engineers because of its positive action, simplicity, drillability and low cost. Designated at the model "A" Wire Line Bridge Plug, it is now avail-

able to the oil well industry.

The object behind the invention was to develop a bridging plug which could be set easily and which could be easily drilled and which would be inexpensive. The present designs seems to embody all these desirable features. The tool is effective as a simple bridging device or as a "Heaving Plug" and is not intended to withstand high differential pressure. When the bridge plug is used as a bridge on which to place sand, the sand will do the work of withstanding these greater pressure differentials when the higher differential pressures are to be encountered.

The alloy of aluminum from which this plug is made is very brittle and the plug is made of a number of small component parts. therefore, the plug can be easily drilled with a Chisel Bottom Bailer or other tools.

A large number of applications have proved that this plug is easily set wherever desired. It can be run on the Operator's sand line or tubing or on equipment furnished as part of the service company's facilities. It may be used with or without leather cups or rubber discs.

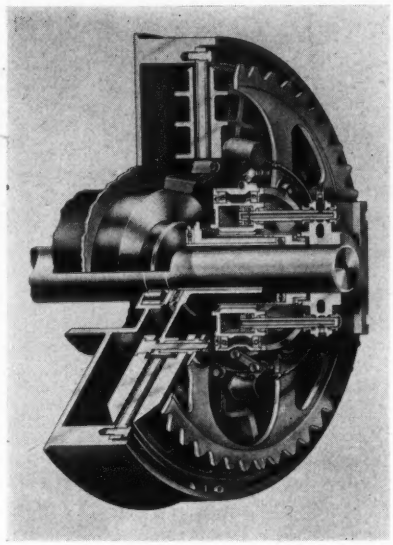
This most effective and most economical bridging plug is furnished in the nominal sizes from 4-½" to 10-¾".

Franks Introduces New Air Clutch

"Franksair", the name for the full air clutch recently announced by Franks Manufacturing Corporation of Tulsa, affords smoother, more efficient operation and is designed to give "finger tip" control, according to a pamphlet released by Franks.

"Over-center" engagement or disengagement, lighter weight and more drum capacity in less space, elimination of mechanical linkage, rotating air seals, and drilled shafts, less heat as the air actuating mechanism is some distance from the area of clutch engagement, single point hydraulically equalized adjustment are other features claimed.

The Franksair clutch-actuator positively engages or disengages by air pressure a final-friction drive winch clutch on a cylinder and piston incorporated into the clutch assembly.



It is a movable annular cylinder on a fixed shaft which operates as a piston and valve arrangement actuated by air pressure introduced in either "in" or "out" chambers and engaging or disengaging the Franks double faced center friction ring clutch.

Franks Announces New Catalog

The Franks Manufacturing Corporation of Tulsa, Oklahoma has announced its new catalog of oil field equipment. Containing field photographs of each Franks product, the catalog offers a complete presentation of the extensive line of Franks drilling rig and servicing units.

The catalog presents the company's equipment in three sections: well servicing units, drilling units, and miscellaneous products.

Catalogs will be mailed to those requesting a copy.

General Motors Series "71" Diesels

The Detroit Diesel Engine Division of General Motors Corp. has just published a bulletin containing their latest specification and technical data on all of their oil field models.

Anyone interested in obtaining a copy can do so by writing to the company at Philtower Bldg., Tulsa, Okla.

New Hydroplex Pump Bulletin

Byron Jackson's new Bulletin No. 47-8020 describes the Hydroplex Pump, a split case multi-stage centrifugal pump for low capacity and high pressure pumping.

The 8 pages in two colors cover various views of the Hydroplex, cross-section schematic, sub-assemblies, parts and dimensional orthographic drawings, and also installation photographs.

The Hydroplex Pump is a smaller and more economical version of the BJ Hydropress, and presents various advantages over the complex displacement type pump such as uniform non-pulsating flow, variable capacities without bypass or speed change; no relief valves; vertical construction which requires only a simple foundation and minimum floor space.

The Hydroplex is equipped with a direct-connected electric motor. Head range is 450 to 1700 feet; operating speed 3550 rpm at 60 cycles and 2950 at 50 cycles.

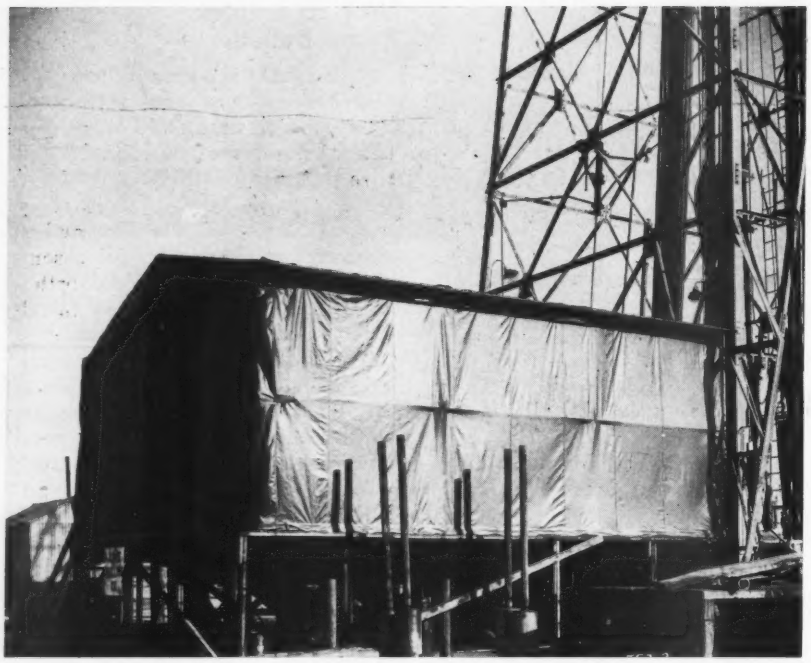
For complete information write for Bulletin 47-8020, Byron Jackson Co., Pump Division, Los Angeles 54, California.

McClatchie Mfg. Co. Has 25th Birthday

The end of 1947 rounded out a quarter century of service to the oil industry by the MacClatchie Manufacturing Company, Compton, Calif. The growth of this firm from its start in 1922, in a one-car garage structure in Brea, California, to its present complete plant in Compton is a story of pioneering and growth which parallels the rise of the petroleum industry.

The MacClatchie firm was first to introduce many of the important features of present day mud pump valves and pistons, including such features as the hardened and ground valve seat, the cup type replaceable piston rubbers, and similar improvements.

The firm is still headed by its founder, J. Warren MacClatchie, who initiated the original business to manufacture oil field specialty items. In 1923, only a year after the firm's beginning, Mr. MacClatchie realized that the fast-growing petroleum industry would re-



Pictured above is the Long Beach Oil Dev. Co.'s well at Terminal Island being drilled by the Acme Drilling Company, headed by Sam Brooks and Tom Bannon.

This new drilling firm is the first in the Los Angeles Basin area to use the new and unique portable engine house covering as manufactured by Langdon Tent and Awning Co. and sold through Renfro Products Co. The uniqueness and practicability of this portable covering is best told in the words of Mr. Chet Culver, toolpusher for the drilling company. Mr. Culver states: "This portable house is constructed in such a manner that it may be erected in 56 minutes and taken down ready to move in 32 minutes. You may also arrange one or all sides for proper cooling and ventilation without discomfort to the men. The covering may be tightly rolled for moving without cracking or sticking in hot and cold weather. Oils and oil base carrying fluids do not penetrate it. Can be cleaned thoroughly with gasoline, kerosene, distillate or solvents without injury to the material."

Since the installation by Acme the Renfro Products Co. has taken orders from many drilling contractors and major oil companies in the California area.

quire increased specialty tool facilities, and he moved the plant to Compton.

In the past 25 years, Mr. MacClatchie has built the firm up to its present position as one of the leaders in the business, selling oil tool equipment throughout the world.

J. Warren MacClatchie is not only a recognized figure in the petroleum industry, but is also noted as a breeder of fine thoroughbred horses. He maintains a stable of racing horses and a large ranch in Southern California devoted to the breeding and training of race horses.

Temblor Try Prospecting

In the Temblor area in San Luis Obispo County near the Kern County line, Continental Oil Co. is drilling in sand and streaks of shale at 1344 ft. with its British-American-Dodd-Thomas Unit No. 1 test in Sec. 22-30s-20e.

In Sec. 8-11n-21w in the San Emigdio area, the company's KCL No. 1-2 is spot coring oil stained sand at 12,276 ft. Santiago No. 1 to the west in the section is fishing drill pipe. Present depth is 8088 ft.

McKittrick Adds Producer

Texas Co. has completed its Westpet NCT Two No. 14-29 in Sec. 29-30s-22e in the McKittrick area for a yield of 96 barrels of 38.1 gravity oil daily through a 10/64-in. bean Original bottom is 5315 ft., with plug at 4660 ft.

Comanche Point Wildcat Coring

Richfield Oil Corp.'s S. P. No. 10 in Sec. 25-12n-19w in the Comanche Point area is spot coring at 6495 ft. The Santa Margarita was topped near 5330 ft. In the Paloma area, the company is rigging up for M. & L. No. 78-24 test in Sec. 24-31s-25e.

Kern River Try Rigging

Charles B. Webster of Bakersfield is rigging up to start the drill in Cauley No. 1-36, a deep test in Sec. 36-28s-27e in the Kern River area. Location falls about a half mile northwest of Oceanic Oil's Producers' wells. Arthur Peterson is engineer on the Webster well.

Pictured above is the crew on the Long Beach Oil Development Co.'s well. From left to right: M. E. Boyette, rotary helper; J. K. Cooper, Bowen Fishing Tool; J. J. Long, pusher, Long Beach Oil Development Co.; "Chet" Culver, pusher, Acme Drilling Company; B. Gearhart, derrick man; Mart Hulshizer, driller; W. H. Nix, rotary helper; E. R. Horton, cat head man; "Rufnex" Renfro, owner Renfro Products Company.

Field Development

PREPARED FROM CALIFORNIA OIL WORLD NEWS SERVICE

Los Angeles Basin

Alondra Well Now Finished

British-American Oil Producing Co. has just completed Village Comm. No. 1 in Sec. 22-3s-14w in the Alondra area. Completion data at press time was not yet available. Total depth is 9926 ft., with casing set at 9225 ft.

The company is preparing to redrill directionally its Alondra Park No. 1 in the section, which was drilled a year ago to below 9200 ft. in an unsuccessful quest for oil. Now labeled Bodger Park No. 1, the well will bottom on the property line between British-American's Bodger and Park Community leases. The objective probably reflects a split royalty arrangement between the two owners of the ground under lease to the operator.

General Petroleum's Alondra Comm. No. 8-1 in Sec. 16-3s-14w is drilling at 8837 ft. On formation test of the interval of 8754-8784, open 46 minutes, packer stuck. Recovery was about 3500 ft. of fluid, including 2500 muddy salt water.

Chino Test Scheduled

Grayco Oil Co., J. P. (Bill) Gray, president and superintendent, is planning to drill a second well in the Chino area in Sec. 13-3s-8w, San Bernardino County. Chino Hills Oil Co.'s Chino Hills No. KB-4 in Sec. 33-2s-8w is idle at 820 ft.

West Newport Well Sands Up

Sanding up after going on the pump, Republic Operators, Inc., is cleaning out its Newland No. 3 in Sec. 12-6s-11w in the Atha sector at West Newport. Hole is bottomed at 3290 feet. Casing is cemented at 3235 ft. No. 4 in the section previously was finished at 3466 ft. for 150 barrels daily. No. 5 is a location. Amerada Petroleum is drilling at 5306 ft. with No. B-48-7 in Sec. 7-6s-10w. No. 37-7 in the section has foundation in.

Beach City Active Area

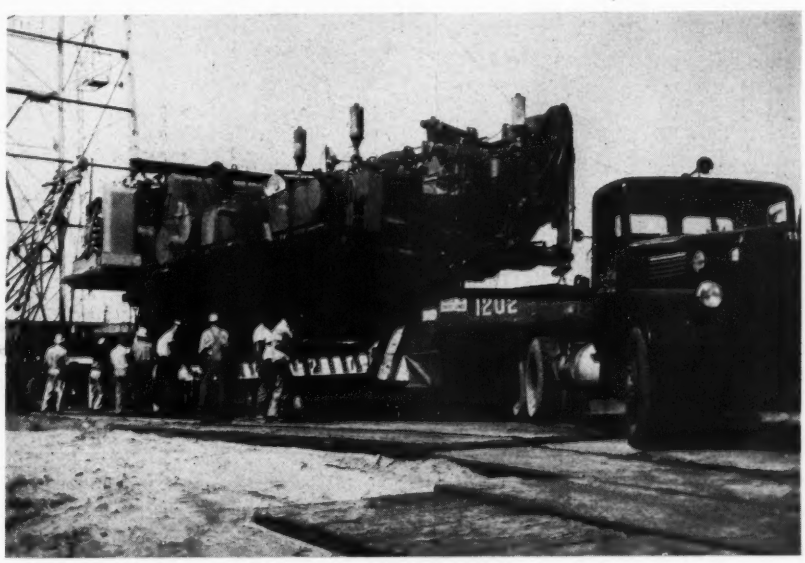
Seguro Petroleum Co.'s No. 1 in Sec. 3-5s-11w on the old Union Oil Copeland lease near Garfield and Westminster in the old Huntington Beach field is drilling at 7430 feet. New drilling jobs in the field, include C. L. Bolton's Lambert Lease No. 1 in Sec. 10-6s-11w, Manks Oil Co.'s No. 413-1 near 13th and Orange, Miller & Ford's No. 4 at 23rd and Acacia, and Oilfield Equipment Co.'s No. 2 at 15th and Palm.

Palos Verdes Test Redrills

In the Palos Verdes area of Los Angeles County, Lesco Oil Corp. is redrilling at 530 ft. with Sepulveda No. 1 in Sec. 22-5s-14w. Old depth is 705 ft.

Inglewood Adds Well

Cleveland Oil Co.'s Machado No. 6-A in Sec. 7-2s-15w in the Inglewood area has been completed at 8451 ft. for a current yield of 281 barrels of 31.9 gravity oil daily, along with 450,000 cubic ft. of gas. Basin Oil, meantime, is drilling at



Santa Maria Drilling Co. speeds operations in moving from one well site to another. Above pictures a Wilson Titan Power Driven Drilling Rig powered with three 350 HP Waukesha Model LROU Gas Engines.

5587 ft. with No. 5-1 in Sec. 28-2s-14w. No. 3-1 in the section is standing cemented with casing set at a point above bottom at 9723 ft.

Richfield Test Fishes

Basin Oil Co. is fishing swab lost in Collins-Wilson Comm. No. 1 test in Sec. 33-3s-9w in the Richfield area. Total depth is 4823 ft., with casing set on bottom and water shut off okay at 4338 ft. and 4570 ft. Perforated in the interval of 4813-4823 ft., reaction was wet and a squeeze job performed. On test of the perforations at 4565-4585 ft., a 370-ft. rise of gas cut drilling mud was noted. Universal Consolidated Oil Co.'s C. & T. No. 1 in Sec. 5-4s-9w is making hole ahead at 6159 ft.

Del Valle Test Digs

North of the Del Valle field, British-American Oil Producing Co.'s Kinler-So. Cal. No. 1 in Sec. 16-4n-17w is drilling at 3670 ft.

Newhall Wildcats Drilling On Down

Bankline Oil Co.'s Newhall Corp. No. 1 in Sec. 31-4n-16w in the Newhall area is drilling at 2463 ft. Mutual Development Corp. is drilling at 5610 ft. with Sanborn No. 1 in Sec. 6-3n-16w and is cleaning out to deepen from 6247 ft. its Lassalle No. 1 in Sec. 10-3n-16w. In the Castaic sector, L. R. Wilhite and Claude Kavanaugh are drilling at 615 ft. with Wilhite-Jenkins No. 1 in Sec. 18-5n-16w. Near Val Verde, Texas Co. is redrilling at 7270 ft. with Malis No. 1 in Sec. 10-4n-17w. Old depth is 8363 ft. Standard of California's Newhall L. & F. No. 5-1 in Sec. 34-4n-16w has plugged back from 9296 ft. to 8000 ft. and is testing. Frew No. 1-4 in Sec. 29-3n-16w is coring at 8568 ft. Casing is set at 8280 ft.

Los Angeles Try Sets Pipe

Richfield Oil Corp. has cemented 7-in. casing at 8415 ft. in U. S. Rubber No. 1 in Sec. 16-2s-12w in the East Los Angeles area. Total depth is 8472 ft. Vail No. 4 in Sec. 9-2s-12w is drilling at 750 ft. E. W. Pauley's Pacific Tube-Stewart No. 1 in Sec. 9 is building rig. General Petroleum is drilling at 1348 ft. with Industrial No. 1 in Sec. 8-2s-12w.

Santa Ana Wildcat Rigs

Tide Water Associated is rigging up for Martin No. 1 wildcat in Sec. 21-5s-10w in the Santa Ana Gardens area in Orange County.

Lawndale Test Digs

Seaboard Oil Co. continues to make steady progress with the drill at 5097 ft. with Pauley-Seaboard No. 81-20 test in Sec. 20-3s-14w in the Lawndale area.

Whittier Try Cased

Livingston Drilling & Dev. Co. has cemented 7-in. casing at 8325 ft. in its Dewey No. 1 test in Sec. 1-3s-11w in the East Whittier area. Bottom is 8517 ft.

SOLVING
Your Leak Problems
—PERMANENTLY!
—INEXPENSIVELY!
ZINC PLATED STEEL BOLTS
MANGANESE BRONZE SLOTTED LUGS PERMIT BOLTS TO DROP INTO PLACE WITHOUT REMOVING NUTS
HIGHLY NON-CORROSIVE COPPER OR DURONZE BAND
LUG POINTS HOLD BOLTS IN POSITION WHEN TIGHTENING
GASKET OF HIGH QUALITY
PRESSURE-TIGHT SOFT NEOPRENE RUBBER
STAUFFER SUPERIOR PIPE REPAIR CLAMPS
PERMANENT, EASILY INSTALLED, INEXPENSIVE REPAIRS THAT WILL WITHSTAND ABNORMALLY HIGH PRESSURES RESULT WHEN STAUFFER SUPERIOR PIPE REPAIR CLAMPS ARE USED. HIGHLY NON-CORROSIVE MATERIALS INSURE PERMANENCY. STAUFFER'S PATENTED SLOTTED LUG CLAMPS ENABLE SIMPLE, TROUBLE-FREE INSTALLATION WITH MINIMUM COST & EFFORT EVEN IN THE HARD-TO-GET-TO PLACES.
SIZES TO ORDER
STAUFFER MANUFACTURING COMPANY
8424 OTIS STREET • SOUTH GATE, CALIF.
• WRITE FOR LITERATURE AND LIST OF DISTRIBUTORS •

WHAT'S NEW?
in Welding Fittings
TUBE-TURN
tt
GET THIS BOOKLET—The Tube-Turn line of welding fittings is BIG, and still growing! This 20-page Supplement to TT Catalog No. 111 gives you data about important new items which, more than ever, make Tube Turns your one source of supply for all welding fitting requirements.
TUBE-TURN—T.M.Reg.U.S.Pat.Off.
TUBE-TURN WELDING FITTINGS AND FLANGES
District Offices at New York, Philadelphia, Pittsburgh, Detroit, Chicago, Houston, Tulsa, San Francisco, Los Angeles
Tube Turns, Inc., Dept. 4101, Louisville 1, Kentucky
Please send me a copy of Tube-Turn Catalog No. 111 Supplement.
Name.....
Position.....
Firm Name.....
Street.....
City.....Zone....State.....

San Joaquin Valley

Gould Hills Test Starts

Atlas Production Co. has staked location for No. 1 wildcat test in Sec. 22-27s-19e in the Gould Hills area, Kern County.

Sam Emigdio Venture Digs

Apex Petroleum Corp., Ltd., of Long Beach has spudded and is drilling ahead at 1439 ft. with Los Lobos No. 2 in Sec. 5-10n-22w in the San Emigdio area.

Kettleman Hills Find Confirmed

Discovery of Eocene production at Kettleman Hills Middle Dome has been amply confirmed by Standard of California's No. 73-30V in Sec. 30-23s-19e, which on formation test flowed an estimated 1000 barrels of 47 gravity oil through an 8/64-in. orifice, together with between 20,000,000 and 30,000,000 cubic ft. of gas a day. The well was redrilled to 12,280 ft. and it may be that Standard will drill no deeper into the Eocene and complete at present depth. Liner is yet to be run for conventional finishing.

Standard's S.F. & F.L. No. 4-2 in Sec. 12-25s-19e in the South Dome area, is standing cemented with protection string set at 9396 ft. Total depth is 9423 ft.

Santiago Try Cores

Western Gulf Oil Co.'s U. S.-Case Comm. No. 1 in Sec. 23-11n-23w in the Santiago area is coring at 3480 ft. On formation test of the 3050-3185 ft., open one hour, recovery was made up of 600 ft. of gassy mud with oil spots. On test of the interval of 3185-3304 ft., open one hour, recovery was 8 stands of mud, 28 stands of muddy salt water with a little sand and scum of oil and some gas. 2 stands were sand.

Mountain View Discovery Flows

Pacific Western Oil Corp. has completed its P. H. Greer No. 53, a schist zone discovery in the Mountain View area, flowing 220 barrels of 41 gravity oil in 18 hours through a 16/64-in. bean, along with 600,000 cubic ft. of gas. Initial cut was 10 per cent mud. The well at last reports was flowing at the rate of 142 barrels of 41.5 gravity oil, cutting 13 per cent, including 9 per cent emulsion, through a 16/64-in. choke.

The hole is bottomed at 7323 ft. in schist, with top of the zone placed at 7260 ft.

Priest Valley Project Drills

In the Priest Valley area of Fresno County, J. Walter Van Atta & Associates was last reported down 1350 ft. with Van Atta No. 1 wildcat.

Fruitvale Test Drills

Superior Oil Co.'s Dougherty No. 88-14 in Sec. 14-29s-27e in the Fruitvale area is drilling at 7715 ft. The drill site is a short distance from where earlier the company test drilled without production success.

Sharktooth Well Comes In

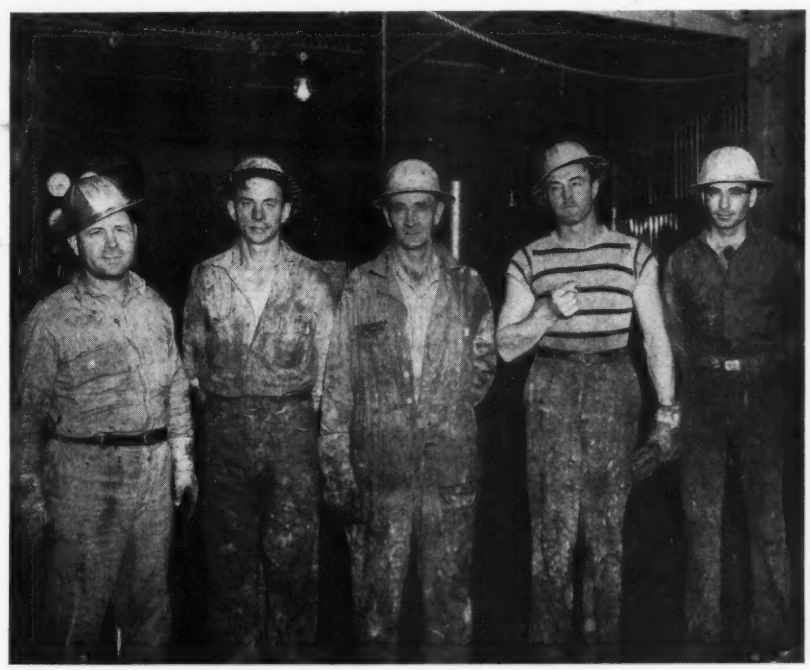
Barnsdall Oil Co. has completed its Alma No. 3 in Sec. 15-28s-28e in the Sharktooth area for an unestimated yield at 2796 ft. from Vedder oil sand. Casing is set at 2777 ft. The company's Leutholtz No. 1 test in Sec. 22-30s-22e near McKittrick is drilling at 4762 ft.

Arvin Try Wall Samples

British American Oil Producing Co. and the Capital Co. are sidewall sampling with Arvin Comm. No. A-47 in Sec. 26-31s-28w in the Arvin area. Top of the Cattani sand was placed at 7265 ft.

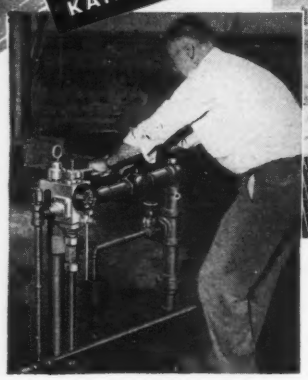
Cymric Try Fails

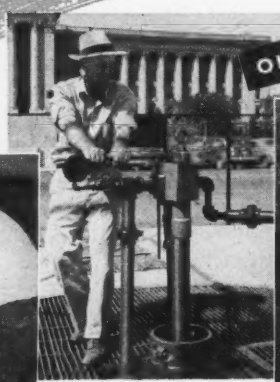
Following an electric log run, Corwin Drilling Co. has abandoned its No. 1 wildcat in Sec. 8-29s-21e in the Cymric area. Total depth is 1511 ft. in gray sand.

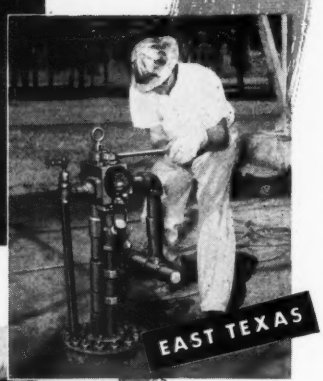


Crew at Pacific Western's Stanton No. 1, East Signal Hill. Left to right: Lon Ulery, driller; Clifford R. Bible, pipe racker; John Fannon, derrick; Ross Downing, cathead and V. J. Clark, lead tong. Loffland Bros., drilling contractors.

THE SWING IS TO *Free* Pumping*







**Kobe Free Pump is an adaptation of conventional Kobe hydraulic pumping. "Free" refers to the fact that it is not suspended in the well at the end of rods or tubing. It is raised and lowered in the well tubing, hydraulically.*

Producers everywhere are shifting to Free Pumping because it assures:

1. **A 15% to 40% saving in operating costs.**
2. **Minimum downtime for pump changes.**
3. **Elimination of large capital investments in servicing equipment.**
4. **A 64 to 1 increase in pumper efficiency.**
5. **A larger recovery per pumping well.**

These are advantages that add up to higher operating profits and increased recoverable reserves. They account for the fact that entire leases are being booked for Free Pumping and why some producers are today running Free Pump bottom hole equipment in with the production tubing, preparatory to changing over to Free Pumping.

If you have not yet seen a Free Pump in action, call your local Kobe representative. Investigate Free Pumping *yourself*. Run one *yourself*, and see for *yourself* why Free Pumping is a real step toward freedom from operating cost worries.

Write for booklet giving details of Free Pumping. It will be sent without obligation to you.

Copyright, 1947

KOBE
ONE OF THE DRESSER INDUSTRIES

KOBE, INC. *General Offices:* Huntington Park, Calif.; *Division and District Offices:* Avenal, Bakersfield, Ventura and Huntington Park, Calif.; Vernal, Utah; Oklahoma City and Tulsa, Okla.; Brownfield, Dallas, Houston, Longview, Odessa and Wichita Falls, Texas; Natchez, Miss.; Great Bend, Kansas; New York City, N. Y.

These are the days of Free Pumping

Grapevine Try Drills

Drilling & Production Co. is drilling shale at 3190 ft. with Reserve No. 45-19 test in Sec. 19-11n-18w in the Grapevine area, Kern County.

Comanche Point Well Completed

In the Comanche Point area along Highway 99, Gene Reid Exploration Co. has placed Gould No. 3 in Sec. 32-12n-18w on the pump for an unestimated yield from 652 ft. Casing is set at 507 ft. No. 4 in the section is being prepared to pump from 625 ft., with casing set at 437 ft. Main oil sand was topped at 438 ft. and the Santa Margarita at 553 ft. No. 5 in the section has been spudded and at last reports was drilling at 119 ft.

Shale Hills Project Digs

In the Shale Hills area of Kern County, General Petroleum Corp. is drilling ahead at 4790 ft. with Berry No. 11-15 in Sec. 15-28s-20e Ninkovich No. 62-9 in Sec. 9-30s-21e near McKittrick is making hole at 6625 ft.

Cuyama Try Cores

Norris Oil's interesting Cuyama No. 2 wildcat in Sec. 25-11n-28w in the Cuyama Valley area in San Luis Obispo County is coring at 1973 ft. in shale. William J. Murray has made location for North Dome No. 1 in Sec. 3-11n-26w.

Blackwells Test Drills

Hamilton and Sherman is digging at 700 feet with Beer No. B-4 in Sec. 17-26s-19e in the Blackwells Corner area, Kern County.

McDonald Job Drills

Independent Exploration Co., which recently abandoned its Theta No. 62 in the McDonald Anticline area, is drilling hard shale at 3904 ft. with Layman No. 1 in Sec. 18-28s-20e in the area. The Theta venture was located in Sec. 20. It gave up the search at 6600 ft.

No Matter How You Figure It

...Le Roi lugging power, acceleration, and dependability pay off in faster round trips

Here are a few of the reasons why you can count on faster round trips and lower drilling costs when "Le Roi's" power your rig:

● **Conservative power rating.** Le Roi drilling engines are available in rated sizes from 100 to 600 horsepower. These engines, however, have power in reserve. That is why they really lug when the going is tough — when there are unusual peak loads. Drilling crews appreciate this extra "helping hand."

● **Fast acceleration.** Just touch the controls of a Le Roi drilling engine and watch it jump. This immediate response, even under heavy loads, reduces round-trip time. Le Roi owes this fast acceleration to its unique valve-in-head design, short stroke, and new carburetion.

● **Dependability.** Here's why Le Roi users have less down-time, less trouble: Block construction provides rigidity. Valve-in-head design is easily accessible, speeding maintenance. Parts are 100% interchangeable. Complete part stocks and prompt service are available in every producing area.

See your Le Roi distributor. Have him show you the latest Le Roi developments.

Write us for literature.

LE ROI COMPANY, Milwaukee 14, Wisconsin

New York • Washington • Birmingham • Cleveland • Tulsa • Butte • San Francisco

LE ROI MILWAUKEE

Oklahoma
Le Roi Company Branch — Tulsa
Carson Machine & Supply Co. — Oklahoma City

East & South Texas, Gulf Coast
Southern Engine and Pump Company — Houston, Kilgore, Alice, Edinburg, Dallas, San Antonio, Texas, and Lafayette, Louisiana.

North & West Texas, New Mexico
General Machine & Supply Co. — Wichita Falls, Odessa, Lubbock, Texas.

Kansas
Carson Machine and Supply Co. — Great Bend

Illinois — Western Kentucky
Western Machinery Company — Centralia, Illinois and St. Louis, Missouri.

Michigan
Hafer Engine Co. — Reed City

Rocky Mountain Area
Industrial Power Units, Inc. — Casper, Wyoming.

Northern Louisiana & Mississippi
Ingersoll Corporation — Shreveport, Louisiana, and Jackson, Mississippi.

West Coast
Le Roi-Rix Machinery Co. — Los Angeles, Calif.

Appalachian Area
Lloyd, Smith Company — Bradford, Penn.
P. C. McKenzie Co. — Pittsburgh

Canada
Drilling Supplies, Ltd. — Calgary, Alberta

Complete Sales and Service Facilities

P-92

Coastal and Northern District

Orcutt Try Rigs

Rice Ranch Oil Co. is rigging Brookshire No. 12 in Sec. 23-9n-34w in the Orcutt area of Santa Barba. County. A semi-wildcat, it will seek production in the zone found some months ago by Union Oil near 3200 ft.

Cat Canyon Well Pumps

Douglas Oil Co. has completed its Los Flores No. 16 in Sec. 22-9n-33w in the Cat Canyon field pumping initially 350 barrels of 12 gravity oil daily, cutting 1 per cent. Total depth is 6140 ft., with casing at 5565 ft.

Seven successful wells have been drilled by the company in the field since March for an aggregate daily production of 3200 barrels and a daily allowable of 1260 barrels. Fletcher Oil Co. owns a 37½ working interest in six of these wells. No. 2 in the section is rigging up and No. 13 is grading.

Huasna Test Drilling Ahead

Danciger Oil & Refining Co. continues to prospect ahead at 3662 ft. with Twitchell No. 1 in Sec. 35-32s-15w in the Huasna area, San Luis Obispo County.

Meridian Try Drills

Near Meridian in Colusa County, Honolulu Oil Corp. is drilling in shale at 4268 ft. with Honolulu-Barnsdall Unit No. 1 in Sec. 23-15n-1w.

Montalvo Try Spot Coring

Standard of California's Maxwell No. 1 in Sec. 23-2n-23w in the Montalvo area is spot coring at 17,201 ft. This is the first drilled hole in California to drill beyond the 17,000-ft. mark and it's about 600 ft. short of the depth attained by Superior Oil Co. with a well drilled in Caddo County, Okla., 17,823 ft. Superior's project failed to produce. Lloyd Corp. has rig up for B-K No. 1 in Sec. 23-2n-23w.

Kirby Hills Project Drills

Shell Oil Co. is drilling at 6040 ft. with Lambie No. 5 in Sec. 25-4n-1w in the Kirby Hills area, Solano County. Harper No. 1 in Sec. 14 is grading. In Sec. 22-8n-1w in the Pleasant Creek area of Yolo County, Pleasant Creek Unit No. 1 is making hole at 4409 ft.

Suisun Try Flow Tests

Flow tests are being run in Standard of California's Suisun Community No. 7 in Sec. 5-3n-1w in the Suisun area, Solano County, Original bottom is 4603 ft., with plug at 4562 ft.

P-R-E P-R-E

POWER RIG & Equipment Company

Phone ANgelus 3-3851

Exclusive West Coast Distributors

WILSON

Power driven drilling rigs and power hoists.
24-hour service on Wilson equipment

Distributors
Gas and Diesel Engines
Ruger Hydraulic Floor Cranes
All Types Wire Rope
V-Belts
Web Wilson Oil Tools
Diamond Chain
"Luber-Finer" Oil Cleaners
Alemite Systems
Other Oil Field Specialties

Call Power Rig & Equipment Company (formerly H & B Sales Company) for technical sales service.

5131-41 Anaheim-Telegraph Road
Los Angeles 22, California

Manufacturers—Distributors—Sales Service Representatives

YOU GET THESE EXTRAS WHEN YOU SPECIFY "KELITE"

1 KELITE pH CONTROL: pH Control takes the waste—the inefficiency—the guesswork out of thousands of cleaning jobs.

2 KELITE SERVICE ENGINEERS: Without cost to you, expert Service Engineers... trained in Kelite pH Control... are ready and eager to help you with any job—big or little.

3 NATION-WIDE FACILITIES: Modern manufacturing plants, convenient warehouse stocks, capable representatives, are ready everywhere to serve American business and industry.

Just write Kelite Products, Inc., P. O. Box 2917—Terminal Annex, Los Angeles 54, California, and a Kelite Service Engineer will call at your office.

"KELITE" REG. U. S. PAT. OFF. • pH CHART COPYRIGHTED 1942 BY KELITE PRODUCTS, INC.

KELITE pH Control

Olivera Canyon Wildcat Working

Water shut off was okay on four holes shot at 4528 ft. and Union Oil Co. now is cleaning out its Wickenden No. 1-28 in Sec. 28-9n-32w in the Olivera area of Santa Barbara County. Total depth 6508 ft. with casing set two ft. off bottom.

Zaca Wildcat Running Casing

With hole bottomed at 4930 ft. Tide Water Associated Oil Co. is running casing in its Chamberlin No. 51 in Sec. 32-8n-31w in the Zaca area, Santa Barbara County. Luton No. 1 in Sec. 29 is digging at 4257 ft.

San Ardo Test Gives Up Search

Texas Co.'s Rosenberg Two No. 1 in Sec. 8-22s-10e in the San Ardo area in Salinas Valley has been abandoned, after drilling to 2124 ft. and running electric log. Rosenberg No. 2 in Sec. 27 is currently pumping 30 barrels of net oil a day. Total depth is 2140 ft. Rosenberg No. 1 in Sec. 27 is shut in. Plugged bottom is 2100 ft.

Conejo Test Standing Idle

Idle at 6465 ft. is the present status of Ti-Bell Drilling and Royalty's Janss No. 1 in Sec. 33-2n-19w in the Conejo area, Ventura County.

Saticoy Try Drills Deep

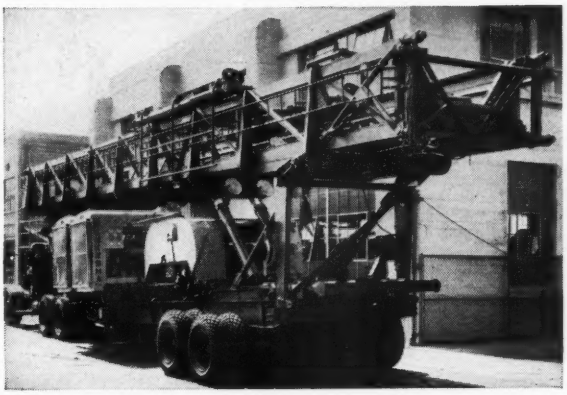
Drilling has reached a depth of 12,432 ft. in Superior Oil Co.'s Saticoy No. 1 in Sec. 10-2n-22w in the Saticoy area, Ventura County.

South Mountain Try Rigs Derrick

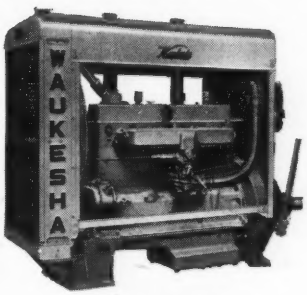
R. E. Havenstrite, prime and important developer of the Del Valle field, is making ready to search for new oil in the South Mountain area. The well, labeled Price No. 1 in Sec. 19-3n-20w, is rigging up.

South America gets

ROTARY DRILLING ON WHEELS



WAUKESHA OIL FIELD POWER



MODEL 6-WAKU OIL FIELD POWER UNIT
6¼ in. x 6½ in., 1197 cu. in. displ., burns gas or gasoline

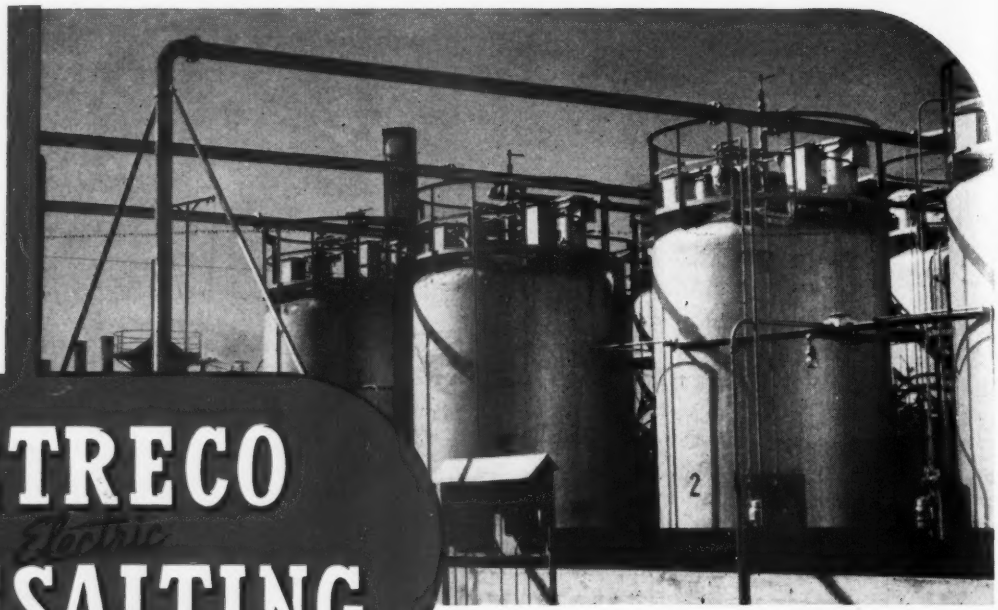
Wagner - Morehouse Inc., of Los Angeles, recently built this semi-trailer mounted drilling unit with a 96 ft. telescoping mast—so that now even remote areas may be sure of dependable drilling. Its two Model 6-WAKU Waukeshas insure reliable power for rotating and hoisting.

Power units may be controlled individually, or both as a single unit. Push button type locks are used on the control levers at the driller's position. Controls have handles at sand reel position and at each engine. Complete engine speed control may thus be had from any of four positions.

The two Waukesha power units drive through hydraulic torque converters, then through airflex clutches and into a chain transmission for compounding. Between power units and drawworks is a two-speed forward and one-speed reverse gear type transmission. Air clutch interlock protects equipment when in low gear.

Model 6-WAKU is the super duty six oil field unit. It can and does deliver greater power per cubic inch displacement. Output rating is 193 hp. continuous—210 hp. intermittent. Get Bulletin 1139.

WAUKESHA MOTOR COMPANY, WAUKESHA, WIS.
NEW YORK • TULSA • LOS ANGELES



PETRECO *Electric* DESALTING

Photo by Permission of Sunray Oil Corp.

IS VITAL TO REFINING EFFICIENCY NOW...

BECAUSE OF THE GREATLY INCREASED **DEMAND FOR PETROLEUM PRODUCTS**

BECAUSE OF THE SCARCITY OF **STEEL FOR NEW REFINING FACILITIES**

Petreco Electric Desalting increases refining capacity. It keeps refining equipment on stream by preventing shut-downs caused by salt plugging, severe corrosion and hard coke formation.

Petreco Electric Desalting prevents salt plugging and hard coking. It retards corrosion caused by evolved HCl. It eliminates many impurities which are major causes of equipment depreciation, metal losses and high replacement demands.

In the face of increasing demands for petroleum products, and the scarcity of steel required to build the refining units needed to provide greater capacities, it is absolutely necessary to get maximum efficiency from available equipment. This is exactly what Petreco Desalting is enabling many refiners to do; if you are charging salty crudes, we can help you, too.

PETROLEUM RECTIFYING COMPANY
5121 South Wayside Drive, Houston 1, Texas
648 Edison Building, Toledo 4, Ohio
530 West Sixth Street, Los Angeles 14, Calif.

PETRECO

SPECIALIZED *Electric* PETROLEUM PROCESSES { DESALTING / DEHYDRATING

PR 48-1

New Pilot Plant Fractionates Crude Oil in One Operation

Complete fractionation of crude oils and preparation of a variety of special feed stocks in a single operation can be accomplished by the use of a new pilot plant which has been installed by the engineers of Universal Oil Products Company, and which recently was put into operation in Universal's Riverside Laboratories.

This new unit which operates at a crude oil rate of about a barrel an hour is completely equipped with automatic control devices and has replaced a number of smaller pilot plants in which distillation of crude oil and preparation of special feed stocks from various cuts was a lengthy step by step series of operations.

Evaluation of the potentialities of the refiner's crude oil is greatly simplified by the new unit and the cost is substantially reduced because the pilot plant can take a relatively small sample of the refiner's own crude oil and prepare samples of feed stock for various process units at a relatively low cost, whereas previously it has often been necessary to make an expensive full scale run in the refinery or in several pilot plants to produce the desired feed stock samples.

The pilot plant consists of three more or less distinct sections which can be operated either separately or as one integral unit, the first section consisting of a gas fired crude pipe still and fractionating column together with two side cut strippers in which are carried out ordinary crude oil fractionations at atmospheric pressure to produce gasoline, kerosene and light gas oil distillates leaving a residual reduced crude as crude column bottoms.

The second section of the unit consists of an electrically heated vacuum furnace and vacuum flash tower which can be used either to process crude column bottoms or extraneous topped crude. This section of the unit is equipped with a three-stage steam jet vacuum pump and barometric condensers which will permit operations at pressures substantially below those normally encountered in commercial vacuum flashing operations.

The third section of the unit consists of a superfractionating system of two highly efficient fractionators aranged for series operation, so that narrow boiling heart cuts can be prepared. It is frequently necessary to prepare such cuts for charge stock for specialized hydrocarbon conversion processes, such as hydroforming for example. The first of these two superfractionators can be operated in conjunction with the crude column to provide for continuous depropanization or debutanization of the straight-run gasoline from the crude oil.

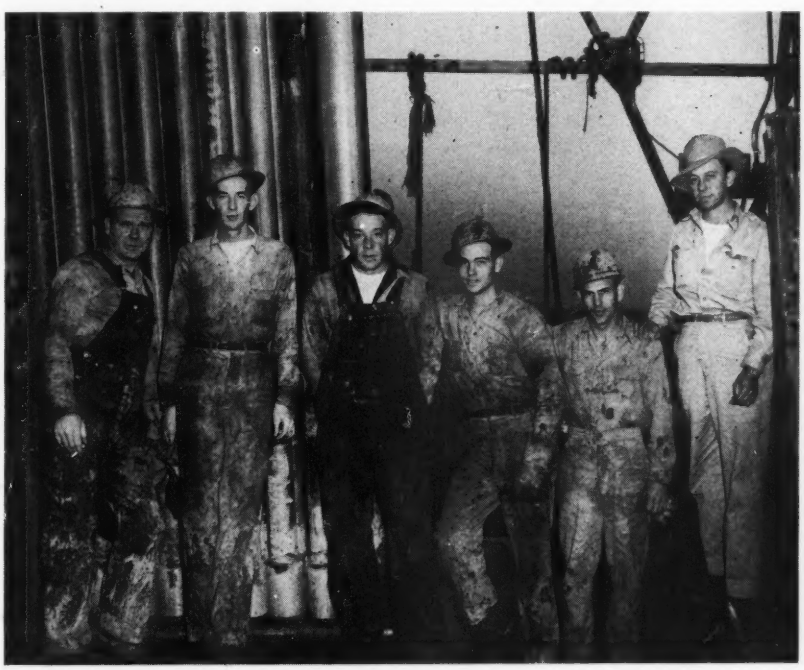
The utility of the unit is easily demonstrated in a typical operation using the entire unit to prepare feed stocks and finished products from a crude oil. The crude oil is charged through the crude heater to the crude column and an overhead cut of unstabilized gasoline is removed.

Two side cuts may also be taken if desired, and these cuts may consist of, for example, light naphtha and kerosene, or kerosene and light gas oil. The overhead product from the crude column may be stabilized in the primary superfractionator, and if further fractionation is required for some specialty product the stabilized product is fractionated in the secondary superfractionator.

The crude tower bottoms are pumped to the flashing section heater where they may be processed at atmospheric or reduced pressure depending upon the depth of fractionation desired. The overhead product is normally used as feed stock for further pilot plant processing. The bottoms product is used as heavy fuel oil or for asphalt preparation.

The flashing section may also be arranged, using the heater for thermal reforming, to process a naphtha fraction for octane appreciation. Viscosity breaking of heavy crude oil fractions may also be carried out. The fractionation system may be used to process wide boiling range materials, for preparing special close boiling fraction products, either at atmospheric or reduced pressures.

The use of the two columns simultaneously permits taking as an overhead product a clean center cut. Other applications of the pilot plant as a whole or in part for feed preparation or processing can be made to meet specific problems without appreciable change to the unit.



Crew at the Shell Bixby Fee well at East Signal Hill. Left to right: Clyde Kinne, lead tongs; Bob Ormiston, cathead; C. O. Hargis, driller; Bob Ballard, rotary; A. E. Gibson, derrick; and Gene Evans, field rep. K. L. Kellogg, drilling contractor.

OB hand cleaner

It's Waterless

Easy on greasy hands

All you do is rub a dab of OB Hand Cleaner on your hands, like ordinary soap, until grime dissolves—then wipe off on rag or paper towel. Needs no water. Cuts grease. oil, tar, creosote, paint, printers ink, Black Magic oil base drilling fluid. Soothes cuts, scratches and chapped skin. Write for free sample.

Packed in 1 lb. and 5 lb. cans

OIL BASE, Inc.

BOX 269, COMPTON, CALIFORNIA

Yorba Linda Well Logging

Electric log is being run in Lyman C. Hisey, Jr., Hurley No. 1 well in Sec. 21-3s-9w in the Yorba Linda field. Present depth is 1803 ft.

Orange County Wildcat Drills

Morton and Sons is drilling at 6150 ft. with El Toro No. 14-1, a wildcat in Sec. 14-6s-8w in the El Toro area, Orange County. Morton's Dominguez Estate No. 1 in Sec. 3-4s-13w near the Dominguez field is making hole at 7261 ft.

Los Angeles holiday visitors were the Allen Guibersons of Dallas, Texas. Guiberson oil field equipment is known wherever oil is produced.

John E. Farrel of Union Oil Co. at Brea retired December 30, after 25 years service with the company. His colorful working career began in the Washington and Oregon logging camps. He later saw service in the copper mines and smelters in British Columbia. He joined Union in 1922 as a warehouseman in Los Angeles. He subsequently worked at Brea, where he established his home.

Casmalia Well Pumping 30 Bbls.

Adams Oil Co. has completed Morganti No. 4 in Sec. 13-9n-35w pumping an estimated 30 barrels of 10 gravity oil a day, cutting 25 per cent. Total depth is 4447 ft. Bell-Casmite Oil has reached a depth of 4850 ft. with its Arellanos No. 3 in Sec. 13-9n-35w and is drilling ahead. Union Oil's Escolle No. A-1 in Sec. 28-9n-24w has been plugged back from 5850 to 4353 ft. and is swabbing and testing by stages.

Santa Fe Try Fishes

Standard of California is fishing for drill collars lost in its Houghton Comm. No. 1 test in Sec. 26-3s-12w in the Santa Fe Springs area. Top of collars is 7760 ft. Hole is bottomed at 10,940 ft. The company's Six Companies No. 4 in Sec. 2-3s-15w in the El Segundo area is drilling at 2464 ft.

Bowen

"Long Distance, Please!"

BOWEN'S FISHING TOOL EXPERTS ARE NEAR YOUR RIG!

When you have a fish in the hole, remember—Bowen's quarter century of fishing tool experience is available to you 24 hours a day... Bowen has more tools, more rolling stock, more service men than any other fishing tool company in California.

Your nearest Bowen service store has a complete stock of these tested tools. No waiting while needed equipment is brought from a distance. *When minutes count, remember Bowen for dependability in a hurry.*

Day or Night Call BOWEN

Santa Fe Springs..Whittier 436-36
Huntington Beach 206
Ventura 6435
Bakersfield 302H8
Avenal 256
Santa Maria 710R

BOWEN FISHING TOOL COMPANY

SANTA FE SPRINGS, CALIFORNIA
VENTURA • BAKERSFIELD • AVENAL • SANTA MARIA
CASPER, WYOMING

Just Say---

YES! You may send me the CALIFORNIA OIL WORLD for one year, for which I enclose $1.00.

Name .....

Address .....

City ..... State .....

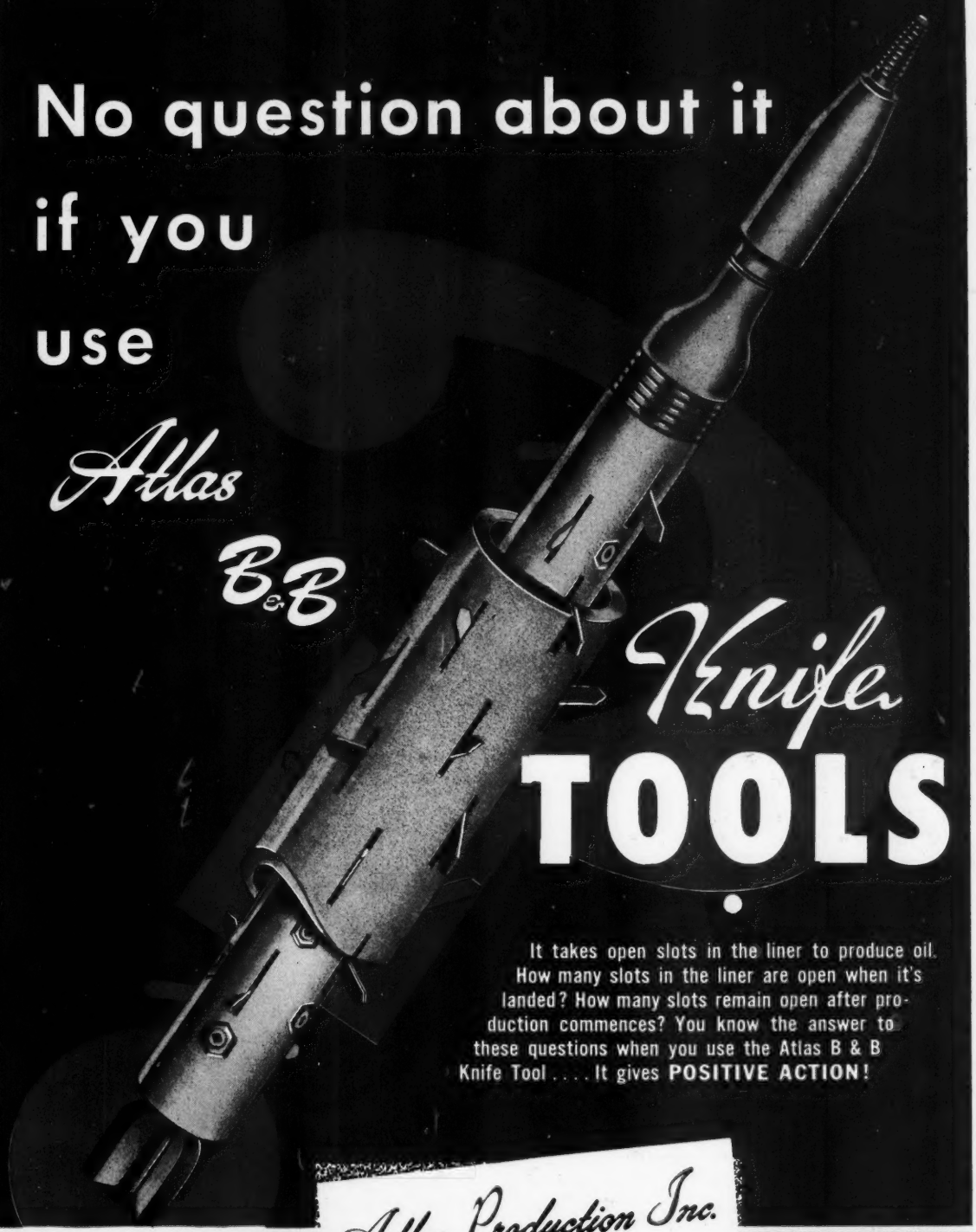
Position ..... Company .....

Check branch engaged in Producing.... Refining..... Natural Gasoline.... Marketing..... Manufacturing.....

Subscriptions accepted only from persons actively connected with the oil industry.

CALIFORNIA OIL WORLD
706 So. Valencia St., Los Angeles 14, Calif.

No question about it if you use Atlas B&B Knife TOOLS



It takes open slots in the liner to produce oil. How many slots in the liner are open when it's landed? How many slots remain open after production commences? You know the answer to these questions when you use the Atlas B & B Knife Tool . . . . It gives **POSITIVE ACTION!**

Atlas Production Inc.

Main Office — 811 West Seventh Street, Los Angeles 14, California, TR 0413
Plant — 1126 Lakeland Road, Santa Fe Springs, California, Whittier 429-654
Export Office — 617 South Olive Street, Los Angeles 14, California, U. S. A.
Long Beach 441-48

Producers and Distributors of HI-PERM • • • California representatives for DRISCOSE